Digital technology and disabled students' experience of higher education in Bangladesh

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Abstract

This study explores the digital technology experiences of students with disability in one higher education institution (HEI) in Bangladesh. Taking an in-depth case study approach the thesis explores the ways in which digital technologies play a part in the 'student experience' of 10 university students – drawing on a Social Model of disability, and the notion of social capital. The findings highlight the importance of networks of informal support systems for students with disabilities – especially in terms of fellow students in the same institution, and also from friends and family from outside the university context. These informal sources of support contrast with the often exclusionary nature of official institutional support from university authorities. In this latter sense, the findings indicate that, in most cases, the underdeveloped official provision of services is not a result of resource scarcity but mostly a consequence of a perceived unimportance of the needs of disabled students. This culture of institutional negligence causes some disabled students to opt out of official technology-related opportunities, and instead look to informal sources of technology use and support to progress through their studies. That said, the thesis does highlight the occasional support of philanthropic organisations in helping disabled students in accessing and utilizing technology, thereby improving their academic experiences. However, the ad hoc nature of these provisions means that such supports were not widely experienced. The thesis concludes with a set of recommendations for how higher education institutions in Bangladesh might use digital technologies as a focus to reorient their provision for students with disability and, therefore, support education as a basic human right, inclusively and for all.

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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1.1 Introduction to the chapter

1.1.1 Description of the thesis

This thesis is based on a study which focussed on the use of digital technologies by students with disability at the University of Dhaka, Bangladesh. With growing uses of technologies in higher education (HE), students with disability are facing newer challenges and this study concentrated on exploring the lived experiences for HE students in Bangladesh. It is important to note that in some countries students would prefer to be known as 'students with disabilities', as opposed to 'disabled students', as they find this to be more empowering, and it places them in a position of being students first – but students with disabilities (Paul, 2000). This is what is commonly called 'person-first' language (Dunn & Andrews, 2015). In Bangladesh, the contextual preference, however, is using the term 'disabled students'. In this thesis the two terms will be used interchangeably in many circumstances.

Four research questions form the basis of this research. These, and the conceptual background, the research focus, definitions and background data, are all contained in this first chapter. Chapters Two and Three comprise the literature review, where other research is explored in relation to this present study. Chapter Four details the Methodology. Chapters Five, Six, Seven, and Eight are the findings chapters – set out according to which research questions are relevant, and Chapter Nine – the final chapter – provides the discussion and conclusion to the research, including any limitations it might have, and recommendations for further research.

1.1.2 Plan of the chapter

This chapter begins with a conceptual background which includes an exploration of HE expansion, the inclusion of 'disabled' students in HE, and the rise in the use of digital technologies in HE. The chapter then turns to the focus of the research and the research questions, as well as the need for this research. Following this is an examination of relevant background data, including legislation and policies regarding disabled students, both on a worldwide scale and in Bangladesh. This introductory chapter concludes with a chapter summary.

1.2 Conceptual background

1.2.1 Introduction

Digital technology and higher education students with disabilities are an important topic. Statistics available in many countries indicate large percentages of students in HE present with disabilities. This is particularly relevant in my country of origin – Bangladesh.

1.2.2 Higher education expansion

Higher education (HE) around the world has experienced continual change over the last few decades in many different aspects of the systems. With expanded student numbers and corresponding increases in staffing numbers, higher education has shifted from elite to mass participation. While the changes in demographics led the changes in institutional culture and styles, the continually expanding and changing job market also led many relevant changes. Those demands welcomed the changes in the mode of provision, nature (for-profit or non-profit), subject provision and types of degrees offered. All in all, the HE landscape now is markedly different from what it was even ten years ago.

Although the developments in higher education have not been uniform across the globe, the transition to mass higher education has been experienced in many countries. Most national systems have seen the rise of non-elite institutions to accommodate students from all socio-economic backgrounds entering higher education. This generalization of higher education has created access for diverse and previously excluded populations, providing these groups the opportunity to enhance their potential by opening access "to previously excluded population groups [such as] women; people from lower socioeconomic classes; previously disadvantaged racial, religious, and ethnic groups; and other populations" (Altbach, 2013, p. 8).

As a consequence of this expanded access, as stated earlier, the number of students in higher education has grown significantly over the last few decades. The global number of university students is predicted to grow from 99.4 million in 2000 to 414.2 million by 2030, representing a projected 314 percent growth (Calderon, 2012). Moreover, regional variations in this growth have altered significantly since 2003. While North America and Europe continue to retain the highest numbers of student entry in comparison to any other region, the rapidly advancing higher education markets in East Asia and the Pacific are projected to emerge as the regions of the largest volume of university entrants (Calderon, 2012). That

said, growth varies in some areas of sub-Saharan Africa still affected by political and economic instability (Altbach, 1999).

One of the most significant features of the recent massification of higher education has been the increased participation of non-traditional populations. This includes female participation in higher education steadily increasing over the last few decades in terms of enrolment, continuation and successful completion. It is estimated that since 1970 the growth of female university enrolment has nearly doubled that of males, although this is significantly less in countries with lower levels of national income (Leathwood & Read, 2008; UNESCO, 2009, 2010 cited in Morgan, 2013).

In recent decades there has also been an increase in enrolment of mature age students. This has been accompanied by an increase in the provision of liberal education and professional courses reflecting an increased "vocationalization" of the curriculum (Tam, 2013, p. 741).

Though it is largely agreed that massification has brought significant growth as well as transformation into higher education, this has not been without accompanying problems. For example, there are growing concerns over the retention of students and quality of degrees now that the systems teaching these degrees have grown. Growth in the higher education sector obviously means more campuses, staff and students that all need to be managed in an efficient manner serving the purpose for why they. Instead, dropout rates are seen to be particularly high with "part-time, commuter students who had work responsibilities [being] significantly less likely to sustain their participation in the study over three years than their full-time, resident, non-working counterparts" (Pascarella & Terenzini, 1997, p. 153).

Students' learning is also seen to be influenced by newer patterns of mass teaching and learning. For example, some HEIs have initiated 'soft courses' and flexible entry requirements to help those students who are not suited to traditional academic study. This seems to put higher education "in the grip of a 'low-quality' debate on quality, standards, comparability and recognition" (Teichler, 2001, p. 6).

1.2.3 Disabled students and inclusion in higher education

One of the key groups within the expansion of higher education (and the focus of the remainder of this thesis) are what can be broadly termed 'disabled' students. While definitions are contested, the UN 'Convention on the Rights of Persons with Disabilities' offers the following working definition of disabled people as being:

> [persons] who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others (United Nations, 2006: Online).

The term 'disabled student' therefore encompasses a diversity of conditions that differ in respect of the student's impairment, severity, need for services and adjustments. Thus 'disabled students' includes, for example, students with learning disabilities, dyslexia, mental health difficulties, physical disabilities and mobility impairments, and sensory impairments. Within this definition, 10.9 per cent of students reported having a disability in post-secondary (HE) institutions in the US in 2007-2008 (US Department of Education, 2015). Indeed, the numbers of disabled students enrolling in higher education has advanced significantly in most national university systems, aided by public policies and institutional non-discriminatory policies in most universities. In Australia, for example, the number of domestic disabled students in higher education increased from 21,307 in 2001 to 50,079 in 2013, out of an overall domestic student population of around 9,85,374 (Department of Education and Training, 2013). Moreover, universities have focused on establishing the provision of appropriate accommodation for disabled students, and the prominence of disabled rights on campus has been pursued by equity activists and high-profile campaigning.

While statistics show a gradual increase of disabled student numbers at HE, this might be an understatement of the actual number of disabled students. One significant reason behind this variation is the disabled students' reticence in disclosing their disabilities during their admission to the HEI. As most of the universities generally are not authorized to seek information about disabilities from students unless those students are applying for special accommodation or grants (Madaus, 2005), disabled students might not mention their disability to avoid being labelled, or because being seen as 'disabled' might clash with their self-concept as a student (Getzel, 2008; Tinklin, Riddell, & Wilson, 2004a).

Alongside the lack of clarity regarding the number of disabled students, the claimed improvement in successful participation of disabled students in HE has been criticized by some commentators (Riddell, 1998). There is also criticism of the quality of specific 'disability services' offered by many universities. This criticism includes insufficient knowledge of staff regarding the needs of disabled students, as well as the inadequate provision of accessible services for those with disabilities. All of these issues problematize

disabled students' experience of contemporary higher education – both socially and academically.

1.2.4   Emerging technologies and higher education

A further element of the recent reconstitution of higher education has been the increased prominence of digital technologies. The core functions of universities are now infused with technology in terms of knowledge creation, dissemination and preservation (Lai, 2011). As such, teaching, learning and research in universities is now more reliant than ever on digital tools and techniques. Furthermore, the pervasiveness of technology extends to the use of technology for administrative purposes and the use of systematic software systems.

Particular attention should be paid to the diverse ways in which students now utilize technology. Students are using it for many needs including course-related study, library website exploration, and utilizing university learning management systems. It is also evident that students are progressively incorporating social networking sites and other web-based technologies into the academic experience (Smith & Caruso, 2010), which is seen to illustrate their propensity for becoming competent users of blended learning.

This is not to say that digital technology use in universities is progressing smoothly. Although universities are making substantial use of ICT (Information and Communications Technology) to support students, teachers and other staff, there is evidence that the competency, as well as, use of technology of these three groups of people is significantly dissimilar (Kazley et al., 2013). Moreover, while students may have expertise in using technology devices for personal communication purposes, this may not be sufficient in terms of academic practice. At this point, some critics argue that the onus falls on teaching staff to integrate technology in ways that support and sustain students' academic use of technology (Keengwe, 2007; Wetzel, 2001). In addition, it is claimed that students will practically value the educational use of technology if the teachers can model efficient incorporation of technology into their teaching and learning programs and resources (Breen, Lindsay, Jenkins, & Smith, 2001). Institutional initiatives of becoming a 'digital university' might not be sufficient unless the whole student community also comes to see technologies as valued tools for their diverse learning experience.

1.3   Research focus and questions

1.3.1   The purpose of the thesis

After first considering relevant previous research and theories from an international perspective, this thesis examines what roles digital technologies are playing in disabled students' experiences of contemporary higher education. Through a qualitative case study, the empirical component of the thesis then specifically investigates the experiences of disabled students when they encounter and use digital technology in one Bangladeshi higher education institution.

The purpose of the thesis is to understand the role of technology in the higher education studies of students with disabilities, and through this understanding to offer insights and research data that can improve the availability and use of relevant technology in the lives of these students.

1.3.2   The problem statement

Students experience many aspects of higher education. These include personal, social, financial and academic considerations. Students with disabilities have been somewhat neglected in mainstream studies of student experience due to the diverse nature of their circumstances and needs. Their experiences are likely to differ significantly from those of non-disabled students. While some studies have been undertaken to address the experiences of this group, there is a need for further exploration of the complexities of the university experiences of disabled learners.

In particular, this study focuses on the digital technology experiences of disabled students – both in their learning and living – at one Bangladeshi university, the University of Dhaka. While many commentators assume that disabled students are using various digital technologies to augment their daily lives and academic engagement at university, understanding how these students are actually experiencing digital technologies (for better and for worse) is of growing importance, particularly in developing countries like Bangladesh.

1.3.3   The research questions

The following research questions guided the research:

- How are students with disabilities engaging with digital technologies at university? When – and for what purposes – are they making use of digital technologies while at university?

- What challenges and barriers do students perceive as hindering their use of digital technology while at university? Conversely, what factors appear to be supporting and enabling their engagement with digital technology?

- How are students' experiences of digital technology use shaped by the 'institutional' provision of technology resourcing by university authorities? What other forms of technology provision are also shaping students' experiences?

- How do students with disabilities perceive the outcomes/consequences of their digital technology use at university? In what ways do students feel (dis)advantaged and (dis)empowered by their use of technology?

1.3.4 The significance and need for this research

There have been very few empirical studies on and around students with disability at higher education in Bangladesh. The University Grants Commission (UGC) of Bangladesh (2019) estimates that around three and half million students attend public universities in Bangladesh, but provides no information about disabled students' enrolment in higher education institutions (HEIs). Similarly, the voices of disabled students are absent in research on higher education in Bangladesh. Nineteen years ago, it was assumed that since only 11 percent of disabled students would ever attend even primary school, very few disabled students would overcome the hurdles of secondary education to reach higher education (Directorate of Primary Education [DPE] & CSID, 2002). The issues of disabled students in HEIs have remained a low priority for academics and authorities such as the Ministry of Education (MoE), UGC, INGOs and other organizations working for disabled people.

This project sought to contribute to filling the research gap on disabled students' experiences in the context of Bangladeshi higher education. In particular, this study expected to provide empirical findings regarding the nature of disabled students' practices, perceptions, challenges, and the inhibitors and/or enablers of using digital tools in relation to their university studies.

Thus, this study is expected to contribute to the disability discourses of Bangladeshi higher education. Its greatest potential, however, lies in assisting relevant authorities of HEIs to plan their response to the needs of students with disabilities in regard to digital facilities and opportunities by better understanding the reality of disabled students' technology experiences. The findings of this study are likely to be relevant also for faculty members, as well as peers, assisting the development of new insights into how they should support disabled students in becoming more effective members of the 'Digital Bangladesh' programme initiated by the MoE and the Ministry of Primary and Mass Education (MoPME). It is hypothesized that this might be done by introducing computer aided learning, technology enhanced teaching-learning processes, teacher development programs, and skills improvization, at all levels of education (Government of People's Republic of Bangladesh [GoB], 2010).

1.4 Background data

1.4.1 Prevalence of disabled students in higher education

1.4.1.1 Global prevalence of disabled people

As is the nature of such data gathering, worldwide statistics of disability do not represent the distribution of disability accurately in every region of the world. However, it is estimated that approximately 15 per cent of the global population live with some form of disability (World Health Organization & World Bank, 2011). According to this estimation, that is around one billion people in the world who could be classed as having some form of disability. According to the World Health Organization (WHO) and the World Bank (WB) (2011) this number is increasing as a direct impact of the rising global population, advances in medical science to decrease child mortality rates, as well as increases in life expectancy. However, due to differences in survey design, method, concept and definition the disaggregated data for different countries are incomparable (United Nations disability statistics database, 2006).

In recent years most countries have used ICF definitions of disability in surveys or national census', while a few countries have developed their own standard to estimate the existence of disability. In Australia, *The Survey of Disability, Ageing and Carers* (SDAC) reported that one in five Australians have a disability; equivalent to 4.2 million of the total population (Australian Bureau of Statistics, 2012). In the US, according to the *American Community Survey 2012* (ACS) the frequency of non-institutionalized disabled people of all ages was

reckoned to be 12.1% (Erickson, Lee, & von Schrader, 2014). This survey considered any person as disabled on a parameter of six specific questions regarding the form of disability. If any person responded affirmative to one or more question, they were considered to be categorized as that particular disability type. In 2013 the estimate rose to 12.6% of the US population (an increase of 0.5%) (US Census Bureau, 2013).

Developing countries contain a significant portion of the world's disabled population. According to the United Nations Development Programme (UNDP), 80 per cent of the world disabled population are located in developing countries (United Nations, 2008). In South Asia, Bangladesh is considered to have a disabled population of around two million people of a total population of 160 million, or 2.5 % (Bangladesh Bureau of Statistics, 2012). The country continues to suffer from malnutrition, inadequate health care systems, overpopulation, ignorance of risk factors, and poverty, all of which are considered to be major compounding factors for disability rates (Haque & Begum, 1997).

1.4.1.2 Regional prevalence of disabled students in higher education

Figures on the prevalence of disability in higher education are less clear. Snyder and Dillow (2012) reported that in OECD countries about 10.8 percent of students at undergraduate level and 7.6 percent at the graduate and first professional level were disabled in 2007-2008. From the data of the Higher Education Statistics Agency (HESA) in the United Kingdom (UK), in 2012-2013 the UK had a total of around 2.3 million students in HEIs, of which 9.5% self-disclosed some form of disability (Equality Challenge Unit, 2014). Comparative Australian data reported a significant increase in the number of domestic students with disabilities in higher education from 21,307 in 2001 to 50,079 in 2013 out of an overall domestic student population of around 985,374 (Department of Education and Training, 2013).

Looking at South Asia's largest country – India – a large scale survey was conducted of 119 universities and 294 colleges by the National Centre for the Promotion of Employment for Disabled People (NCPEDP, 2005). Not all universities and colleges replied, but nationwide 52 universities and 96 colleges returned data about their disabled students. This survey found around 0.1% students with disabilities in the universities, and about 0.5% in the colleges. It needs to be mentioned that these universities have a 3% reserved quota for enrolling disabled students according to the law. It was suggested in the reporting of these data that most of their places had been filled by non-disabled students due to the unavailability of disabled

candidates. However, it should also be noted that definitions of disability in this data may not be comparable to definitions used elsewhere.

A number of patterns can be identified within these broad disability population figures from various countries. A small number of studies have identified students with dyslexia as predominant among the disabled students who declare disability at any stage of their study in HEIs (Riddell & Weedon, 2014; Tinklin, Riddell, & Wilson, 2004b). The Equality Challenge Unit (2014) admits that from the Higher Education Statistics Agency's (HESA) student records, in 2012-13 among the total number of disabled students in the UK, 48.5% had a 'Specific learning difficulty'. Moreover, the preponderance of disabled students in particular academic disciplines has also been noted. As Riddell and Weedon (2014, p. 40) observe, based on statistics of the HESA for 1999-2000, in the UK "17.6% of students with a diagnosis of dyslexia study creative arts and design subjects and [they represent] 11.8% of all students who disclose a mental health difficulty. Medicine, dentistry and veterinary science appear to have a low proportion of students with any type of impairment. Education does not appear to include any students with a mental health difficulty". Mandinach, Camara, and Cahalan-Laitusis (2002) cited in Konur (2006) portray that although there is a significant rise in the enrolment rate of students with disabilities, these disabled students' access to the professional programs in terms of individual choice are still impeded by HEIs.

1.4.1.3 Disabled students in Bangladeshi higher education

Despite the international profile of disabled students in higher education, in terms of the focus of the present thesis the picture is less clear in Bangladesh. There is an absence of empirical research as well as statistics regarding the numbers and/or statistics of disabled students in higher education. Anecdotal reports from commentators in this field concede that a small number of disabled students are likely to obtain admission into universities. While each university collects statistics about the disabled students' enrolment and other related information, there is no authoritative nationwide profile regarding the status of disabled students in higher education.

1.4.2 Legislation, policies and other forms of provision for disabled students in higher education

With the definitions and research boundaries laid down, we now need to consider disabled students' experience within higher education systems and higher education institutions. In many developed countries disabled students' enrolment in higher education has advanced significantly with the introduction of legislative acts and public policies regarding direct access to HEIs. The US, for example, introduced Section 504 of the *Rehabilitation Act* (1973), and *Americans with Disabilities Act* (ADA) (1990). Similarly, Australia initiated the *Disability Discrimination Act* (DDA) (1992) and the UK introduced Section IV of their *Disability Discrimination Act* (DDA) (1995) and *Special Educational Needs and Disability Act*[1] (SENDA) (2001) – all designed to change the traditional limited access to the pursuit of higher education. These policies/acts are recognized by the rest of the world as 'driving forces' for the accessibility of higher education for disabled students (Konur, 2006). They have been a catalyst for the establishment of non-discriminatory policies and the initiation of appropriate accommodation for disabled students in HEIs (Riddell & Weedon, 2014).

Other factors limit the provision of assistance for those in HE with disabilities. Over the last few decades, the rising voice of equity activists and of the disabled people themselves have been demanding recognition that the current perception of disability is seen as a societal obstruction that inhibits equal participation on a large scale rather than being a mere individual limitation or impairment. In addition to the policies, this is also considered as an impetus for advancing the participation of disabled students.

The policy statutes for access opportunity and support services of disabled students in HEIs are diverse, depending on governmental commitment towards disability and state preparation for effective practice of inclusiveness. The United States is regarded as the forerunner in this due to its introduction of Section 504 of the *Rehabilitation Act* (1973) and *Americans with Disability Act* (ADA) (1990) which have been recognized as 'cornerstone' legislations for disabled students' access to higher education (Konur, 2006). Section 504 assigned particular liability on institutes for providing for disabled students all the opportunities which their non-disabled peers enjoy (Rao, 2004), particularly, "a) access to facilities and activities; b) admission policies and practices that do not discriminate on the basis of disability; c) testing procedures with appropriate accommodations; and d) provision of auxiliary aids and

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[1] Many Acts and other forms of legislation are referred to in this section, so the titles of these have been italicized to enhance their visibility in the text of this thesis

services" (United States Department of Labor, n.d.). It also addressed academic modifications such as providing extra time for degree completion, allowing course substitution, and taking measures to supply auxiliary aids like audio text and interpreters (Katsiyannis, Zhang, Landmark, & Reber, 2009). Alongside this act, Title II of the ADA demanded all private and non-federal sectors comply with non-discrimination practices on disability issues. With the enactment of the ADA (1990), HEIs have since been required to set up appropriate academic 'accommodations' such as eliminating physical barriers in classrooms, as well as assisting disabled students by importing appropriate computer software (Hebel in Johnson, 2006).

Australia's endeavours for the legitimate recognition of the rights of disabled persons escalated with the adoption of the *Disability Discrimination Act* (DDA) by the Commonwealth of Australia in 1992. This act highlighted Australia's effort at creating a discrimination free state for all citizens, and particularly for disabled people (Sharma, 2014).

Several government polices like *A Fair Chance for All* (1990), and *Equality, Diversity and Excellence* (1996) also advocated access in higher education for disabled persons, but these policies had little influence on the practice of teaching and learning in universities (Ryan, 2011). The DDA covers many sectors including education of the disabled. Section 21 restricts educational authorities from discriminating against disabled persons, particularly in regard to rejecting admission appeals, refusing or constraining access to eligible services, and hindering participation by developing or nominating curricula which seem 'inconvenient' for disabled persons (Commonwealth of Australia, 2014). However, this act has been criticized for providing education providers with an indemnity if they rationalize discrimination made against disabled students. The clause regarding 'unjustifiable hardship' allows a concession for not enrolling any disabled person if the educational institute reports a lack of resources or an inability to study successfully (Commonwealth of Australia, 2014).

Later, some of the issues which needed interpretation were reported in the *Disability Standards for Education* 2005. These Standards are considered as subordinate legislations of the DDA provisions regarding education. With this, all education providers (including the HEIs) remain accountable for adopting 'reasonable adjustment' in the areas of enrolment, participation, curriculum design, accreditation and delivery, student support services and harassment and victimization (Commonwealth of Australia, 2005). But still the Standards have provisions to allow education providers to limit the required adjustments on the ground of 'unreasonable adjustments' or 'unjustifiable hardship' indemnities.

HEIs in the United Kingdom are also legally responsible for developing feasible accommodations for their disabled students (Vickerman & Blundell, 2010). These legal obligations originated from several anti-discriminatory acts of legislation. Among them the *Disability Discrimination Act* (DDA) was enacted in 1995 with a restriction for all service providers on any sort of discrimination against disabled persons. It placed an obligation on all HEIs for developing *Disability Statements* which contain information about existing policy and provision for disabled students with a focus on oncoming developments regarding policy and practice (Tinklin & Hall, 1999). Furthermore, this act made provisions to support disabled students through the *Disabled Student's Allowance* (DSA). The students had to declare their disability and submit medical certificates to be entitled to this allowance. The DSA consisted of an annual general allowance, an equipment allowance per course and an allowance for non-medical personal assistance (Tinklin & Hall, 1999).

South Asian countries have significant numbers of legislative acts, policies, and guidelines for the disabled. India, with the world's third largest higher education system after USA and China, incorporates a number of developmental steps for disability issues through various acts and policies (Jameel, 2011) such as the *Persons with Disability (Equal Opportunity, Protection of Rights and Full Participation) Act* (PWD, 1995) which announced a noteworthy provision to reserve a 3% quota for disabled students in all government grant holding educational institutes. The HEIs were covered only by this clause of the act, otherwise the act did not mandate any other accommodation regarding education, in particular for HEIs (Bhambhani, 2012). During the ninth five-year plan (1997-2002) UGC in India had implemented a scheme called *Higher Education for Persons with Special needs* (HEPSN) which aimed to support universities/colleges of education to develop teacher preparation programs in special education and to equip disabled students with proper assistance in HEIs (University Grants Commission of India, 2000).

Beside this, the Ministry of Human Resource Development (MHRD) of India formulated an *Action Plan for Inclusive Education of Children and Youth with Disabilities* (IECYD) in 2005 which envisioned delivering a learning setting to disabled children and youth in which a comprehensive development in their learning and abilities may occur (NCPEDP, n.d.). The action plan proposed that all universities appoint a *Disability Coordinator* who is to be considered as a *one stop shop* for the assistance of disabled students (NCPEDP, n.d.). Furthermore, keeping in mind the need for comprehensive documentation for the disabled population of the country, the government formulated a *National Policy for Persons with*

Disabilities 2006, viewing an environment where protection from vulnerability does not discriminate and scope for participating in the society is undivided for disabled people (Ministry of Social Justice and Empowerment, n.d.). For the higher education sector, the policy articulated the rights of disabled students to obtain admission and all other applicable facilities in universities, technical institutes and professional courses which had been granted in its previous statutes. The policy also restates that the PWD Act's reservation rules in HEI for disabled students needs to be duly enforced. Uniquely, the policy encourages the HEIs to set up *Disability Centres* which would support the learning needs and install accessible precincts like classrooms, hostels, cafeterias etc. (Ministry of Social Justice and Empowerment, n.d.)

In a similar fashion, Pakistan, the second largest country of this region, developed comprehensive disability-specific laws, regulations and policies such as the *Mental Health Ordinance 2001*, the *National Policy for Persons with Disabilities 2002* and sectoral laws and policies such as the *Disabled Persons (Employment and Rehabilitation) Ordinance 1981*, the *National Policy for Rehabilitation of the Disabled 1986*, and the *National Policy for Special Education 1999*. The government was also preparing to formulate two statutory acts, the *Pakistan Peoples with Disabilities Act 2*008 and the *Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act 2008*. Despite being considered by some as the most comprehensive national policy towards accomplishment of meeting the diverse needs of the disabled students in education, rehabilitation and care (Ahmad & Yousaf, 2011), the *National Policy for Persons with Disabilities 2002* did not mention any specific plan for the higher education sector, although there was an applicable clause there about the integration and mainstreaming of disabled students in the education system. Its emphasis was on raising the interest of institutes, mainly universities, to research various issues regarding disability (Government of Pakistan, 2002). Thus, the policy is considered noteworthy by Bano, Shah, and Masud (2013) as they commented: "Although disabled students have privileges of, at least, 2% enrolment in higher education institutions, yet there are hardly any special arrangements in these institutions for catering [for] the individualized needs and demands of disabled students" (p.6).

1.4.3 Higher education legislation for disabled students in Bangladesh

Bangladesh is signatory to almost all international declarations promoting a discrimination-free and equal opportunity-based education system for disabled students. The country has introduced numerous initiatives to promote inclusive education from the early stages of

schooling with provision for forms of special education and inclusion in mainstream education for the disabled. The main impetus grows from the right described in the Bangladeshi constitution for all citizens to access educational institutes. As stated in article 28(3): "No citizen shall, on grounds only of religion, race, caste, sex or place of birth be subjected to any disability, liability, restriction, or condition with regard to access to any place of public entertainment or resort, or admission to any educational institution" (Ministry of Law Justice and Parliament Affairs, 2000, p. 8). Within the spirit of the Salamanca Declaration (1994), the government of Bangladesh formulated the country's first comprehensive *National Policy on Persons with Disability* in 1995 which established the right of disabled children to equal participation in education.

Based on this policy the government enacted the *Bangladesh Persons with Disabilities Welfare Act, 2001*, but this act postulated only a few developmental areas including education, health, employment, accessibility and transportation. Notwithstanding this general endorsement, the act offered few tangible arrangements towards ensuring the legislative rights of education for disabled children. As such, critics have accused the act of being rooted in a medical model which emphasises a person's impairment rather than the societal and environmental impediments that lead to this impairment (Disability Right Watch Group, 2009). In addition, activists and academics argued that the legislative measures represented a 'welfare attitude' to the disability issue. Eventually, after years of continuous advocacy and consultation, a new *Rights and Protection of Persons with Disabilities Act* was passed in 2013. This act is considered to be more rights-based, accommodating several rights for disabled people. For example, participation in all spheres of education upon availability of appropriate facilities is stated to be a legitimate right for disabled students. Moreover, Article 33 restricts the authority of educational institutions to reject enrolment of any student based on their disability if the student qualifies in all other requirements (Ministry of Social Welfare, 2013).

In addition to these acts, students with disabilities in Bangladesh are also covered by the *National Education Policy 2010*. In this policy both inclusive and special education were promoted for creating opportunities to fulfil individual educational needs of this particular group of students. However, no significant clause for disability issues in higher education was narrated through these legislations and policies.

Few public universities have formulated their own regulations for enrolling disabled students. As such, Hossain (2012) reports that visually impaired students (the major group of disabled

students in Bangladeshi HEIs) are enrolled in only 4 out of 34 public universities and in 32 out of 2153 colleges under the National University (NU). In the University of Dhaka, reservation regulation for admission and yearly stipends are available for visually impaired students in spite of the presence of greater number of students with other disabilities. These trends suggest that although appropriate legislation of disability rights might be in place, the Bangladeshi higher education system has a long way to go to reach the ideal scenario.

1.5   Conclusion

Disability requires much more exploration than has happened so far, though despite the declaration supporting equitable human rights, attention to gaining knowledge about the issue has not been promoted.

This introduction presents the scope and boundaries set for this study, but before proceeding to the research findings, it is important to present a detailed discussion on the theories involved, the relevant frameworks and scholarly discussions that will provide the basis for the research and data analysis. These are presented in the upcoming chapters.

Chapter Two: Conceptualizing disability – a Social Model

2.1 Introduction

This chapter addresses the issue of conceptualizing disability. What is disability? How is it perceived – by those who are disabled, by others, by authorities, by medical establishments? This chapter also justifies the the preferred model for exploring disability throughout the thesis – the Social Model of disability.

This chapter opens with definitions and the International Classification of Functioning, Disability and Health (ICF) conceptualizations of disability. After this, two pertinent disability models are introduced and discussed, the Medical and the Social Models of disability. After comparing the two, the Social Model of disability is presented as the model followed in this research.

2.2 Conceptualizing disability

2.2.1 Towards a working definition of 'disability'

'Disability' is a complex as well as a controversial topic. Stemming from their ambition to portray disability in a language that can be understood by all, the World Health Organization (WHO) defined disability in 1980 as "any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being" (World Health Organization, 1980). It should be noted that this definition combined three different forms of human experiences – impairment, performance limitation (disability), and experience of disadvantage (handicaps).

While long considered a robust definition (Simeonsson et al., 2003) the WHO has since been criticized for defining 'disability' solely as an outcome of disease, impairment and/or health condition of the person. Critics accused it of failing to emphasise on the role of environmental factors which might cause a person to live in a disabling situation (Whiteneck, 2006). Consequently, after some decades of debate around a comprehensive redefining of 'disability', the WHO re-conceptualized 'disability' in their *International Classification of Functioning, Disability and Health* (ICF) (2001). The revised conception defined disability as:

> … an umbrella term for impairments, activity limitations and participation
> restrictions. It denotes the negative aspects of the interaction between an

individual (with a health condition) and that individual's contextual factors (environmental and personal factors) (World Health Organization, 2001, p. 213).

This concept combines medical and social models of disability and frames disability as a shared outcome of both biological and external factors (Iezzoni & Freedman, 2008). It constitutes a "bio-psycho-social model" of disability which conceives disability as resulting from interactions between health characteristics and contextual factors (World Health Organization, 2001). The ICF has been welcomed for its acknowledgement of physical, social, and attitudinal forces in the definition of disability (Whiteneck, 2006). In many ways the ICF definition complements the concept of disability proposed by the *Union of the Physically Impaired Against Segregation* (UPIAS). The UPIAS stated that, "disability is something imposed on top of our impairments, by the way we are unnecessarily isolated and excluded from full participation in society. Disabled people are therefore an oppressed group in society" (cited in Šiška & Habib, 2013, p. 396). UPIAS's definition contributed a useful perspective for understanding disability by disagreeing with the previous impairment-focussed concept of disability (Šiška & Habib, 2013).

Five years after the new WHO definition of disability, in 2006 the majority of countries in the United Nations agreed to promote rights-based services with the aim of protecting the dignity of persons with disabilities (PWD). The *United Nations Convention on the Rights of Persons with Disabilities* 2006 defines persons with disabilities (PWD) as people:

> who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others (United Nations, 2006).

It has been claimed that this convention endorses a new pattern of attitudes and perceptions towards disability, thus moving the understandings away from a narrower viewpoint of 'object [of] charity' to a greater 'subject with right[s]' where the disabled person is no longer a passive recipient of medical support and social salvation, but is an empowered actor meriting equal participation in society (United Nations, 2006). While making a shift in thinking, this definition has been criticized for overemphasizing the rights of groups with long term impairments while other 'short-term', 'fluctuating', and 'episodic impairments' remain largely excluded (Leonardi et al., 2006, p. 1220). Despite the existence of criticism

and limitations, each of the perspectives and models mentioned sheds light on different aspects of the lives of disabled people and deserve a deeper examination.

2.2.2 The ICF functioning and disability domain

The *functioning and disability* domain is comprized of two parts. The first is the concept of *functioning* consisting of *body function and structure*, *activities*, and *participation* (where in explaining 'body function and structure', the ICF refers to both the physiological and psychological aspects of human organisms (Whiteneck, 2006)). The second is the concept of *disability*, understood as occurring if any problem persists with human functioning in the three inter-related components of body function and structure, activities, and participation. It is at this point that the components of a disability shift to a new set of categories encompassing '*impairments*', '*activity limitations*' and '*participation restrictions*'. *Impairments* are seen as being problems/decrements in body structure or in body functions which have turned into "significant deviation or loss" [of[ability (World Health Organization, 2001, p. 12). The '*activity limitations*' refer to problems in performing life activities such as listening, walking, or eating; while '*participation restrictions*' are difficulties in being involved or participating in any circumstance of life including employment, belongingness or transportation (Whiteneck, 2006; World Health Organization & World Bank, 2011).

2.2.3 The ICF contextual factors domain

The second of the two domains the ICF refers to when defining disability is the contextual factors domain. Health conditions (i.e., diseases, injuries, disorders) and/or other impairments are seen as conditions which limit an individual from performing normal life activities which consequently cause a person to experience "participation restrictions" arising from various personal and environmental contextual factors (World Health Organization, 2001, p. 14). In the case of disability, both personal and environmental factors restrict an individual from executing tasks, and these factors hinder a person's performance in society. The ICF acknowledges that the interaction between health conditions and contextual factors increases the incidence of 'disability' (Whiteneck, 2006; World Health Organization & World Bank, 2011).

This thesis learnt from the following modified framework of the ICF disability model (see Figure 1), with a particular emphasis on the *disability* domain and its interlinked components. As the research in this thesis was conducted in Bangladesh, this discussion and design also remain mindful of the disability taxonomy described in the Bangladeshi *Rights and Protection of Persons with Disabilities Act, 2013,* where twelve types of disability are listed and defined. In conceptualizing different types of disability, this research refers to these definitions. The disability types according to the Bangladeshi Disability act have been combined with the ICF conceptualization of disability in Figure 1 below:

Health Condition
(disorder, disease, and injury)

Functioning

Body function and structures

Activities

Participation

Autism or autism spectrum disorders
Physical disability
Mental illness leading to disability
Visual disability
Speech disability
Intellectual disability
Hearing disability
Deaf-blindness
Cerebral palsy
Down syndrome
Multiple disabilities
Other disability

Body Function
Mental functions
Sensory functions and pain
Voice and speech functions
Functions of the cardiovascular, haematological, immunological and respiratory systems
Functions of the digestive, metabolic, endocrine systems
Genitourinary and reproductive functions
Neuromusculoskeletal and movement-related functions
Functions of the skin and related structures

Body Structure
Structure of the nervous system
The eye, ear and related structures
Structures involved in voice and speech
Structure of the cardiovascular, immunological and respiratory systems
Structures related to the digestive, metabolic and endocrine systems
Structure related to genitourinary and reproductive systems
Structures related to movement
Skin and related structures

Learning and applying knowledge
General tasks and demands
Communication
Mobility
Self-care
Domestic life
Interpersonal interactions and relationships
Major life areas
Community, social and civic life

Disability

Impairments

Activity limitations

Participation restrictions

Figure 1. Disability framework modified from the International Classification of Functioning, Disability, and Health (ICF) (World Health Organization, 2001), and the Ministry of Social Welfare (2013). Rights and Protection of Persons with Disabilities Act (2013). Dhaka: MoSW.

While considering the ICF conceptualization of disability, this thesis mainly draws upon the social model of disability to understand issues related to digital technology usage by students with disabilities. This is because (dis)ability of participation is seen by many as not only a consequence of individual health conditions and impairments, but also of other factors.

The writings of Shakespeare (2006) and Shakespeare and Watson (2001) support a particular school of thought which claims disability is contributed to by both physical conditions and the workings of society. Thus, the impetus of this thesis lies in the ICF's notion of disability and intends to "include all the dimensions of disabled people's experiences: bodily, psychological, cultural, social, political, rather than claiming that disability is either medical or social" (Shakespeare & Erickson, 2000, as cited in Shakespeare & Watson, 2001, p. 20).

Alongside these regulatory definitions, we also need to consider that academic models of disability serve to describe multifaceted issues encompassing the notion of disability. Various models of disability studies have emerged in different phases of history. The following sections will discuss two of these which have impacted on contemporary disability concepts.

2.3 Disability models: The Medical Model

The 'Medical Model', which flourished in the late 19th century (Drimmer, 1992; Iezzoni & Freedman, 2008) perceives disability as a limitation of the person caused solely by physical impairments and/or health conditions. From this point of view, disability is largely understood as a physiological limitation manifested by any damage of body parts, diseases, or other health conditions including mental structures or functions (Llewellyn & Hogan, 2000; World Health Organization, 2001; Simeonsson, 2006). According to this model, the existence of impairment in any individual is the sole criterion for labelling him/her as a 'person with disability', whether or not that person is limited in daily activities (Mitra & Sambamoorthi, 2006).

Since (according to this model) most, if not all, disabilities have a medical origin, the model suggests that a person with a disability should be treated by medical professionals (Crossley, 1999; Drimmer, 1992). In other words, physicians should be the primary authority for supervizing the treatment and rehabilitation of people with disabilities (Crossley, 1999; Iezzoni & Freedman, 2008; Marks, 1997; Mitra & Sambamoorthi, 2006).

Under the Medical Model, society positions any person with a disability in a "sick role" (Parsons, 1958, cited in Drimmer, 1992, p. 1347) and discounts any obligation to place them into mainstream society (Drimmer, 1992). The Medical Model of disability is characterized by an effort to cure the cause of disability so that the individual with disability can be rehabilitated as a non-disabled individual (Mohamed & Sefer, 2015). This model actually reinforces the concept of normalcy as it finds disability within the individual and attempts to correct it instead of modifying the built environment to facilitate the individual's functioning (Mohamed & Sefer, 2015). Thus, the Medical Model treats disability as a deviation from normal bodily function and tries to fix the individual according to the established idea of a normal body. This model focuses entirely on impairments while ignoring the probable cognitive and emotional factors of illness and disabilities (Marks, 1997).

2.4 Criticism of the Medical Model

Michael Oliver states that, "it is not individual limitations of whatever kind, which are the cause of the problem, but society's failure to provide adequate services" (Oliver, 1996, cited in Ellis and Kent, 2011 p. 81). Kattari, Lavery, and Hasche (2017) state that the Medical Model of disability focuses on the disability or impairment as the problem, thus devaluing and disempowering the individual. In his abstract to his discussion paper, "Models of disability: Their influence in nursing and potential role in challenging discrimination", Scullion (2010) states that, "disability is fairly universally a negative concept. Disabled people have frequent contact with health services, however much of this experience is viewed as discriminatory" (p. 697). Scullion then starts the text of his discussion paper by citing that the lives of disabled people are limited by the impact of discrimination, which they face in every aspect of their lives including in education, employment and health (Barnes, 1992; Pfeiffer, 2003, cited in Scullion, 2010).

Much that is negative has been said about the Medical Model of disability, which now has fewer and fewer supporters (Scullion, 2010). Critics even suggest that, "Implied within the call to move away from the medical model of disability is a suggestion that the impact of conceptualizing disability emerging from this paradigm is itself disabling" (Whitehead, 2006, cited in Scullion, 2010, p. 699). In the medical model those with disability are labelled as 'patients' and their disability is viewed as an illness (Scullion, 2010).

Three criticisms of the Medical Model of disability mentioned by Scullion (2010), which are of significance in the present research are:

- It sees disability as a personal problem.

- It has undermining and alienating effects.

- It invalidates (the person) and creates a pathway to institutionalized disablism and abuse.

Extending what has been written here so far, the Medical Model is a model created by the medical establishment initially for convenience – to categorise the disabled so that they can be processed and provided with "treatment" and funding. There are clearly many problems with this. People with disability too often find that their primary means of identification is 'disabled'. This possesses a strong effect on a person's self-image and traps people with disabilities within the perception that they have a problem (Telford et al., 2006; Galvin, 2005, cited in Scullion, 2010, p. 700).

In this manner, it can be argued that the Medical Model has had undermining and alienating effects on people with disability. This model promotes "a devaluation of the worth and citizenship of people on the basis of their disability status" (Scullion, 2010, p. 700). It denies uniqueness, ostracises those who are not normal, and encourages people "to assume the values of those who devalue them" (Stalker et al., 1996, in Scullion, 2010, p. 700). In fact, in the medical paradigm, people with disability are regarded essentially as those who are different. They are thus invalidated as having non-conforming bodies. They are 'abused' or 'maltreated' – mostly not deliberately – by the medical profession they are trained to rely on, all as a part of a process of institutionalized disablism and abuse (Scullion, 2010).

2.5 The Social Model of disability

The Social Model of disability was induced because many working or researching in the area of disability were concerned with what they saw as ongoing discrimination against the disabled. They felt that the disabled were not fitting well into society, and not through their own fault.

> People with disability are socially created as a deviant group and stigmas
> attached to the alternative or assisted technologies used by this group to

navigate daily life perpetuate their deviant status and the need to be treated.
(Ellis & Kent, 2011, p. 90).

The social model, which developed from the intellectual and political arguments of the Union of Physically Impaired Against Segregation (UPIAS) (Shakespeare, 2006, p. 197) paved the way for a number of political ideologies to emerge, some of which (in Britain) were disabled-led activist groups such as the Liberation Network of People with Disabilities. This group argued that social divisions in society were sustained by 'psychological beliefs in inherent superiority or inferiority' and "people with disabilities suffered inherent problems because of those disabilities" (Shakespeare, 2006, p. 198).

The term "Social Model of Disability" was first used in 1983 by Michael Oliver[2] during his time of developing an academic course on "promote and develop disability politics" at the Open University. This structural approach was quickly adopted to understand disability.

The Social Model, in contrary to the Medical Model of disability, comprehends disability from a human rights perspective, describing disability as a by-product of social negligence or oppression towards the needs of people with disability (Mitra & Sambamoorthi, 2006; Oliver, 1996). It firmly constitutes the notion that disability is not a personal attribute. Instead, the Social Model views individuals with impairments and other health conditions as victims of unfriendly or adverse social environments thrusting the notion of 'normality' at them (Marks, 1997; Mitra & Sambamoorthi, 2006; World Health Organization, 2001). This model "puts the problem back into the collective responsibility of society as a whole and there is a de-emphasis upon the individual" (Llewellyn & Hogan, 2000, p. 159). Unlike the Medical Model, this Social Model opposes the established 'social obsession of normality' in which people are required to comply with a standard way of functioning (Llewellyn & Hogan, 2000).

The Social Model is significantly different from the Medical Model. It perceives 'disability' as being a label attributable to a member of society when that society fails to ensure adequate conditions in which people with 'differences' can lead their lives as they wish (Mohamed & Sefer, 2015). The Social Model sees physiological limitations as impairments which can effectively be removed by modifying the built environment according to the needs of people

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[2] Michael Oliver who in 1983 first adopted the term "social model of disability" as part of a team from UPIAS working for Open University to create an academic course on "Promote and develop disability politics"

with disabilities. When society fails to do so – and the impairments hinder a person's interactions as a social being – these people become 'disabled' (Mohamed & Sefer, 2015).

However, some scholars portray this model as an overrated attempt to position social constructs like discrimination and oppression as the primary causes of disability. Shakespeare and Watson (2001) point out that the Social Model overlooks situations of critical health conditions or profound impairment where the survival of that individual would be critical without medical intervention. Terzi (2004) in her philosophical critique, criticizes the Social Model for failing to acknowledge the practical impacts of impairment and for disagreeing with any standard of performance that a person should be able to attain for minimum human functioning. However, the reality of the difference between a person with disability and a person without disability is not denied by the proponents of the Social Model, whose focus is primarily on the conception of disability and biased policy construction depending on organic inequality (Reindal, 2009) that impedes the full participation in society of people with disabilities (to the extent that non-disabled counterparts can participate in society). Vasey (1992) cited in Barnes and Mercer (2006, p. 38) precisely notes what the social model interprets and what it misinterprets:

> The social model is not about showing that every dysfunctioning in our bodies can be compensated for by [a] gadget, or good design, so that everybody can work [an] 8-hour day and play badminton in the evenings. It's a way of demonstrating that everyone – even someone who has no movement, no sensory function and who is going to die tomorrow – has the right to a certain standard of living and to be treated with respect.

In regard to technologies for the disabled, proponents of the Social Model of disability state that we devalue the efforts and adjustments of people with disabilities and we view the technologies they use as weak (Wendell, 1996, cited in Ellis & Kent, 2011).

> While people with disability may regard the accommodations or the assistive and adaptive technologies they use as an ordinary part of life, as non-disabled people would a kettle, washing machine or even computer, the technologies used by people with disability are stigmatized. Further, people with disability are often treated as helpless or dependent for using them (Wendell, 1996, p. 30, cited in Ellis & Kent, 2011, p. 81).

Roulstone (1998) states that there are three ways of viewing technology in relation to people with a disability (cited in Ellis & Kent, 2011). These are technicism, the deficit model, and

social construction. Technicism concentrates on technological change rather than social change. The deficit model creates "new and specialised technologies to address the gaps between the person and their limited abilities as a result of their impairments" (Stienstra & Troschuk, 2005, cited in Ellis & Kent, 2011, p. 82). Moreover, disability as a social construction is where technology is integral to the politicization of disability.

2.5.1 The Social Model and oppression

Although it has some critics, the Social Model is seen by many as championing the needs of people with disabilities. It is concerned with their needs, but not just on a micro level. The Social Model also looks deeper into disability as being characterized by social oppression. Shakespeare is one of many prominent authors who states that the disability movement focuses its attention on social oppression (Shakespeare, 2006, pp. 197-99).

In campaigning for the rights of the disabled, UPIAS was an organization that was significant in declaring that the disabled are oppressed. As early as 1975 they stated that:

> In our view, it is society which disables physically impaired people. Disability is something imposed on top of our impairments, by the way we are unnecessarily isolated and excluded from full participation in society. Disabled people are therefore an oppressed group in society (UPIAS, 1975, in Shakespeare, 2006, p. 198).

UPIAS further stated that non-disabled people and organizations 'such as professionals and charities' cause or contribute to that oppression. It is not charity or pity that is required – they say – but civil rights, with the best insights coming from services and organizations run by disabled people (p. 199).

Shakespeare (2006) – in discussing the oppression of the disabled – also uses the words 'exclusion' and 'discrimination' to refer to the plight of disabled people and repeatedly refers to the need for social change as one significant aspect of the Social Model of disability (p. 199), considering the model as helping to improve self-esteem by building a positive sense of collective identity. He refers to disability as a 'universal experience of humanity' (p. 203) (according to the Social Model) as opposed to being an experience of the disabled. Thus, the oppression of the disabled is something for humanity as a whole to deal with, and not just the disabled. This is the essence of the critical view of those who support or promote the Social Model of disability.

2.5.2 The Social Model and empowerment through care

In overcoming oppression, it is empowerment that the Social Model suggests is what disabled people are really seeking. Keyes, Webber, and Beveridge (2015) refer to empowerment, and pathways to empowerment, as the issue that disabled people face (pp. 236-237). The authors also speak of relationships as a means of enabling support and this empowerment. They see "empowerment through care" as being an essential concept (p. 238). Like Shakespeare (2006), Keyes et al. (2015) also views the need for empowerment as being necessary because of the history of oppression of the disabled.

Again, like Shakespeare (2006), Keyes et al. (2015) stress that, "in order for people accessing services to be empowered, the locus of control within services must remain with the people accessing those services" (p. 240). These authors also stress that interdependent relationships aids empowerment.

2.5.3 The Social Model: Empowerment through care and being normal

Some authors discuss support for people with disability, challenging "the conceptualization of independence as self-sufficiency while maintaining the importance of independence as self-determinacy" (Held, 2006; Tronto, 1993, cited in Keyes et al., 2015, p. 240). By this the authors simply mean that providing care for the disabled (such as resources and empowering relationships), although necessary, is not enough. To be empowered, they argue, disabled people need control over the decision-making processes. They need to have a say in the decisions that are made in regard to their needs and care.

In speaking of the Social Model of disability, Winance (2016) states that this model challenges the process of normalization – but that it does not sufficiently challenge the 'normative ideal' of integrating the disabled into ordinary society so that they can be like everybody else. She states that the Social Model does refer to society changing in order to 'normalize' disabled people. However, she goes one step further in speaking of the need for society changing along the lines of not being structured so disabled people must perceive the need to conform (pp. 101-102). This goes hand in hand with the concept raised by Keyes et al. (2015), among many others, which states that the provision of resources, and all other aspects of 'care', need to be determined by the disabled themselves in order to allow them to be on a pathway to empowerment, whereby the question of being 'normal' is no longer particularly relevant.

2.6 The Social versus the Medical Model

Kattari et al. (2017) compare the Social and Medical models of disability. These differences are set out in tabular form below.

Table 1

The Social Model Versus the Medical Model

THE SOCIAL MODEL OF DISABILITY	THE MEDICAL MODEL OF DISABILITY
• Recognizes impairment as distinguishable from disability. • Defines impairment as individual and private. • Defines disability as structural and public. • Believes individuals are disabled by society according to society's reactions to them. • Sees disability as a social creation.	• Treats disability as an individual problem that needs to be fixed

Note: The content of the table is based on Kattari, et al. (2017, p. 870)

Fawcett (2000) explains that Medical Models of disability are usually associated with an emphasis on being cured or on adjustment to one's impairment. In contrast, she states that the Social Model of disability is a socio-political approach which "rejected the representation of disabled people by 'experts' and redefined 'disability'" (p. 21).

Fawcett (2000) further states that while the Medical Model is criticized for focusing on specific medical conditions:

> The social model focuses on attitudinal and physical constraints. Disability is not regarded as the problem of the individual, but as a social and environmental issue. An individual is therefore not disabled by their specific condition, but by external constraints which prevent them from living their life in the way that they would want (p. 22).

Shakespeare (2006), another prominent commentator on disability, sees the shift from the Medical model towards the Social Model of disability as stemming from a concerted challenge against the historical oppression and exclusion of the disabled.

There are many critics of the Social Model; for example, Ellis and Kent (2011) state that the Social Model of disability is urgently in need of revision because it needs to be clearly recognized that the lives of people with impairments are limited by their disability.

One major deficit Shakespeare (2006) lists in regard to the Social Model is that it suggests people have been disabled by society rather than their bodies. Other critics, such as Anastasiou and Kauffman (2013) state that:

> Proponents of the Social Model use the distinction between impairment and disability to reduce disabilities to a single social dimension—social oppression. They downplay the role of biological and mental conditions in the lives of disabled people (p. 441).

These authors quote others in stating that Social Model theorists believe "disability is wholly and exclusively social" and best developed through using the "concept of oppression" (Abberley, 1987; Oliver, 1996 cited in Anastasiou & Kauffman, 2013, p. 441). These are only parts of statements, however, and are taken out of context. They are also out of context because even if the apparent meaning of these few words is that disability is exclusively social, for example, this is the view of the authors, and not necessarily of all those who promote the Social Model of disability. Reading further in Anastasiou and Kauffman's (2013) research, they refer to a 1976 statement made on behalf of the Union of the Physically Impaired Against Segregation, implying that this organization had formulated the core arguments of the social model. It can be said that the authors then continue in their article to debunk the Social Model based on representations of that model that are not necessarily accurate summaries of the model's premises.

Anastasiou and Kauffman (2013) claim that the proponents of the Social Model distinguished impairment and disability as the psychological and social dimensions of disability. This is a helpful distinction as it reflects an emphasis of the Social Model – that as a "social model", it considers disability as a concept with social connotations and meanings. Thus, we come back to one of the points made by proponents of the Social Model which is that, in the words of Anastasiou and Kauffman:

> impairment refers to the loss or lack of some functioning part (organ or
> mechanism) of the body. Disability refers to a society that discriminates,
> disadvantages, and excludes people with impairments, as it does not make
> appropriate accommodations and gives preference to those without impairment
> (pp. 444-445).

If this is a distinction made by proponents of the Social Model, then it is a very helpful distinction as it portrays the Social Model as exposing the stigmas attached to those among us who have traditionally been labelled as 'disabled' and indicates a more modern way of thinking about disability, which tries to address the social problems people with disabilities have.

The Social Model of disability sees disability as a form of social oppression (Ellis & Kent, 2011), presented initially by the disabled scholar Michael Oliver (Terzi, 2004). They see it as pointing to the complexity of disability, and also "to our understandings of disability as informed by disabled people's reflection on their own experience" (Terzi, 2004, p. 141).

Oliver (1996) states that the Social Model neither represents a social theory nor should be considered as one. However, it does provide a good working definition. He acknowledges that not all the aspects of disability can be explained by the Social Model, but that it helps us to better understand the world. He states that the Social Model situates the problem of disability "squarely within society" (Terzi, 2004, p. 143).

Shakespeare (2006) offers insights into the aspects of the Social Model, as well as a list of a number of strengths of the model, which are presented below.

Figure 2

Strengths of the Social Model (elements adopted from Shakespeare, 2006, p.199)

Barnes (2013) states that through political activism and scholarship, disability "is now regarded in policy circles as not simply a medical issue but also a human rights concern" (p. 23). He states that the Social Model of disability has been a major catalyst for this.

In regard to technology, Ellis and Kent (2011, p. 89) contend that "a consideration of impairment is vital to the full inclusion of people with disability in the digital arena", thus acknowledging the need for the term 'impairment' as opposed to disability.

Owens (2015) states that the social model of disability "has been labelled an outdated ideology in need of further development" (p. 385), then, after examining the Social Model further, states that this is despite its achievement of "enabling disabled people to claim their rightful place in society" (p. 386).

Barnes (2013), in sharing his personal experience with his parents' disability, argues that anyone "with any form of accredited impairment are disabled by an unjust and uncaring society" (p. 12). He points out clearly that society disables people. This is an emphasis in the Social Model. This emphasis is criticized by some (as detailed throughout this chapter), particularly in regard to claims that proponents of the Social Model go too far in emphasizing the role society has in disempowering the disabled. However, as long as we have a society where disabled peoples' needs are not being met – such as in HE institutions in Bangladesh (as well as in perhaps every country in the world) then such an emphasis is not too strong. Perhaps it is only in tackling disability as a problem of society, rather than the individual, that we can address the negligence that has occurred. Such negligence may only be a by-product of the mechanisms of society with all their shortcomings and impersonality, but neglect is there, and as stated in the opening chapter of this thesis, combating this neglect is one of the aims of this research.

The Social Model of disability is clearly now the preferred model, despite its limitations. It is a model based on the needs and perceived rights of the disabled, as opposed to being a model based on convenience and the need to label and categorise disabilities or those who have them. Many governments of the world, ranging from the USA to China, "have [now] employed social model-type rhetoric to introduce policies to secure disabled people's rights" (Barnes, 2013, p. 21).

2.7 The Social Model of disability as the framework of this research

The Social Model of disability has been chosen as the framework of this research because this research sets out to explore the perceived needs of students with disability. The basis of this research is not to explore the needs of organizations to categorise disabled people or their 'impairments'. The Social Model of disability allows an approach and an emphasis which considers the needs of the individual and considers these needs from their perspectives (Burchardt, 2004).

The participants of this study are disabled students at the University of Dhaka. Although a significant proportion of Bangladesh's population have disabilities, a much smaller proportion of students at the university have disabilities. There is little support for disabled people in Bangladesh, including students. The students who were a part of this research have already done very well in overcoming obstacles and pursuing their studies. Prior to beginning this research, the researcher talked widely with the students and the stakeholders and it became increasingly clear that the challenges are originated in the system rather than stemming from any lack of capacity of the individuals. At the planning stages, the discussion illustrated how the students who had made it to HE had been greatly supported by their social capital – family members, teachers and peers. while the Medical Model and ICF had placed greater emphasis on the limitations of physical capabilities, the Social Model directs our attention to how the challenges can be overcome with necessary interventions and supports. As the Social Model sees disability as "something imposed" on the disabled, additional to their impairments (Šiška & Habib, 2013, p. 396), it seemed well-positioned for the theoretical framework for this research.

The disabled students the researcher knew certainly had 'restrictions' or impairments, but they were doing very well – they were achieving much more than many non-disabled people who had not qualified for university. While at university they fought hard to overcome many difficulties in relation to their studies, particularly in regard to the availability and suitability of technology resources.

The Social Model perceives the problems these students have as society's problems, not just the problems for the students (Oliver, 1996). The Social Model explains that disability is not a personal attribute, but a label – a classification – imposed by society on those it considers to be less able. The researcher was quite aware from the beginning that many disabled students, especially the more successful ones, did not accept this label. Some who felt compelled –

even forced – to accept it were unable to see themselves as normal, but judged their disability as a handicap (see Marks, 1997, for example). The Social Model opposes the 'social obsession' with 'normality' (Llewellyn & Hogan, 2000). As stated in Section 2.5, it sees disabled as a label imposed on members of society when that society fails them, when society fails to ensure adequate conditions for its disabled to live normal lives.

This is relevant to this current research. The Social Model portrays a worldview which 'rings true'. Also, the Social Model does acknowledge that there are differences between people with and without a disability (Reindal, 2009). The Social Model also considers oppression (Shakespeare, 2006, for example), and the other side of oppression – empowerment (Keyes et al., 2015; Shakespeare, 2006) and points to the need of disabled people themselves to control their own resources (Keyes et al., 2015). Since in the context of a developing nations, resources and connections (in other words, 'social capital') make major differences in outcomes, this research requires the keen application of an oppression and empowerment lens, which strengthens the case for adopting the Social Model as the theoretical framework for this study.

Later on, this proved to be resourceful as the data indicated that the challenges in accessing technologies and their utilization often stem from the perspective of the society towards disability in Bangladesh. The enabling factors, the required assistance and the desired independence (self-dependence) of the students, were contingent on societal perceptions of disability as Keyes et al. (2015) have also shown in similar contexts. Overall, both the contexts and established causality of all the cases and perspectives this research studied, strengthened the case for basing this research on the Social Model of disability.

2.8 Conclusion

Definitions of disability mention various elements ranging from "restrictions" and "lack of mobility "to "something imposed on top of our impairments" (cited in Šiška & Habib, 2013, p. 396). Definitions or emphases within definitions of disability are important as they point to the model – or its focus and philosophy – being used by their authors.

Two models of disability were introduced along with the ICF framework. The proponents of the Medical Model suggest that disability is defined according to personal factors, circumstances and limitations. In contrast, proponents of the Social Model insist that disability needs to be defined in relation to "something imposed on top of our impairments, by the way we are unnecessarily isolated and excluded from full participation in society"

(Union of the Physically Impaired Against Segregation (UPIAS), cited in Šiška & Habib, 2013, p. 396.)

This chapter has explored the characteristics of each model, concluding that the Social Model of disability is the preferred model, and the one that best considers the practicalities of being 'impaired' or 'disabled'. It explains why the Social Model of disability was chosen for use in this research. A detailed discussion on the social context follows in the next chapter.

Chapter Three: Conceptualizing the 'student experience' and social context

3.1 Introduction

While much of the literature on higher education focuses on issues of teaching and learning, there is a growing interest in making sense of the everyday experiences of university students. This is what is often referred to as 'student experience'. Student experience is broadly concerned with the lives and lived experiences of university students. Reviewing the literature regarding students' experiences has provided a grounding framework for understanding the experiences of students with disability at university – thus setting the scene for the empirical element of this thesis.

This chapter – the second of two providing a conceptual framework for this thesis is concerned with the experiences of students during their time in higher education. It discusses areas of enquiry and issues emerging from the student experience literature. Following this, the chapter moves into theoretical approaches in the student experience literature.

There are many approaches used in discussing student experience, but the ones highlighted in this thesis are centred around Bourdieu's use of 'social capital'. This chapter discusses what social capital is, and how it is a significant concept in the experience of HE students. The chapter also discusses class inequality in relation to social capital, and then finally visits critiques of Bourdieusian social capital.

3.2 Areas of inquiry from the 'student experience' literature

Higher education is continuously evolving and has experienced dramatic changes during the past few decades. Students from broadening social, economic, cultural and ethnic backgrounds are now entering higher education and therefore increasing the diversity of campuses. This diversity makes it challenging for universities to effectively address student matters (Morgan, 2012) and places increased emphasis on the quality of the student experience.

From an institutional point of view, the concept of 'student experience' covers not only students' experience of support services, but of almost (if not all) aspects of student life including (but not limited to) personal, social and academic welfare. From the perspective of institutionalized competitiveness, the provision of high-quality student experience has

therefore become a vital component of higher education services (Morgan, 2012) as universities try to perform well in terms of student progression, withdrawal rates, and student satisfaction. As a result of this, the student experience is often categorized as part of the broader notion of student engagement – and perceived as an important factor in the expected development of students in higher education. Kuh (2009) argues that engagement impacts students' learning and development in higher education and helps students to benefit from institutional support frameworks. This, in turn, promotes their continuation in education – a primary factor why higher education authorities may see student experience as a sub-group of student engagement.

The Higher Education Funding Council for England (HEFCE) considers student engagement as "giving students an active role in the development, management, and governance of their institution, its academic programs and their own learning experience" (cited in Kleiman, 2015, p. 63). Similarly, The UK Quality Code for Higher Education (QAA) (2012) addresses engagement as an effective tool for the empowerment and inclusion of students by considering them as *partners* and/or *co-producers* in all university activities (cited in Kleiman, 2015). Such definitions therefore tend to frame the notion of 'student experience' as embedded in (and very much influenced by) the wider, emerging concept of 'student engagement'.

From a social science perspective, 'student experience' is more specifically understood to be an important aspect of making sense of the realities of higher education for students. However, Stokoe, Benwell, and Attenborough (2013, p. 76) argue against framing student experience as a subordinate domain of engagement. Instead, they suggest a wider approach to conceptualizing 'student experience' that includes, or relates to, "… teaching and learning issues (e.g., course structure, feedback, resources) as well as socially-oriented aspects of student life (e.g., accommodation, campus environment, student union, entertainment)". Based on the above comments, for the purpose of this literature review, 'student experience' will not be seen as a part of student engagement, but as something separate, which may, or may not, involve student engagement. This chapter presents a brief discussion on areas of inquiry and key issues emerging in the academic literature regarding student experience in higher education.

Academic literature addressing 'student experience' has flourished with numerous studies focusing on diverse issues regarding how students encounter university life. In the literature, students' experiences are not limited solely to academic learning issues, but also encompass a

broad range of non-study related experiences that help students in the establishment and maintenance of social support networks, the formation of self-identity, and, most importantly, making sense of the realities of campus life. The following sub-sections provide a brief overview of the areas investigated in previous empirical research, thereby identifying pertinent questions that the current PhD study set out to explore.

3.2.1 Academic aspects of student experience

Research literature on student experiences of higher education places particular importance on first-year students. Much of the academic literature has examined how students encounter the support provided to them by universities. Often this relates to the specific challenges involved in the transition from school into university programs, and the factors engaged in adjusting to new learning environments.

Research by Morosanu, Handley, and O'Donovan (2010) sought to understand the views and experiences of first-year students towards different formal and informal support in adjusting to academic study offered by higher education institutions. Morosanu et al. (2010) discussed the need for different resources of support for first-year students in assisting them to adjust to their academic transitional challenges. Key questions in the study included the reasons for the students' selection (or non-selection) of university support services, and the students' use of other informal and/or 'unofficial' support services. They found that formal institutional support – such as group work, teaching methods, written instruction, students' class parties and support centres – play an important role in helping students to confront different study challenges in Higher Education Institutions (HEIs). However, they also highlight the importance of unofficial, non-university initiated forms of support. These supports "from below" come from university contacts (i.e., peers, roommates, informal study groups) as well as non-university bodies such as family and relatives, local friends, and others. The authors argue that there are many determining factors that influence students' reliance on or reluctance towards these two support systems. One of the most significant factors is personal choice. Students often prefer to select which support they like to take and which they do not. Most of the time this choice is shaped by the level of intimacy/interaction with a person/s involved with the support system. Morosanu et al. (2010, p. 675) highlight some incidences where students were unwilling to receive formal support services when they perceived the relationship with the support staff was "unilateral, infrequent and hierarchical". On the other

hand, most of the students preferred the kind of support service that offered strong emotional ties (such as closeness, exchange of feelings) and frequent interaction.

Other researchers have focused on the academic experiences of first-generation students. Compared to non-first-generation peers, first-generation students are particularly vulnerable to both academic and other higher education demands (Gibbons, Woodside, Hannon, Sweeney, & Davison, 2011; McCarron & Inkelas, 2006). Soria and Stebleton (2012) compare the HEI experiences of first-generation students from lower socio-economic backgrounds to non-first-generation students from college-educated families. Their aim was to investigate how variation in social capital influences the achievement/success of first-generation students from low-income families. It is evident from their empirical study that first-generation students are significantly different in academic involvement in comparison with non-first-generation students: they are less likely to become engaged in discussion with faculty members, group discussion, the generation of new ideas, class participation and providing insightful examples, or asking questions.

The 'fit' of students' academic preparedness and overall academic abilities with institutional demands have been characterized as notable concerns in regard to the success of contemporary HEIs. Classroom engagement has been highlighted as a key challenge for first-generation students from lower socio-economic backgrounds, with some students having never made presentations or asked questions during class (Temple, Callender, Grove, & Kersh, 2014). The presence of online notes, lectures, and materials also resulted in students skipping class. The majority of these students believed that the availability of online resources enabled them to spend more time outside the university, mostly for non-study-related activities (Temple et al., 2014). These students also encountered several challenges during their adjustment to university life. They experienced difficulty remaining motivated during their studies. Some felt uncomfortable during group discussion and others found it difficult to manage the volume of assigned academic tasks. The majority of students believed that study management was difficult when added to other non-academic commitments such as family life, paid employment, and personal responsibilities (Baik, Naylor, & Arkoudis, 2015).

It has been found that the teachers of first-year students play a crucial role in mitigating the academic transition at the commencement of university enrolment (Scanlon, Rowling, & Weber, 2007). Effective communication with the lecturer can also help a student to successfully configure new insights regarding learning requirements in higher education

(Read, Archer, & Leathwood, 2003) that help students to better understand the rigour of institutional academic demand. In addition, active contact with university staff has been found to increase some students' confidence.

Scanlon et al. (2007) report some instances where problems in understanding the academic expectations of teachers were found to cause students to be unwilling to participate in academic activities. Specifically, some working-class students explained that their lack of participation in academic activities stemmed from their belief that university staff, as well as their peers, did not sufficiently understand their transitional issues (Soria & Bultmann, 2014). Gee (2000; cited in Lawrence, 2001) mentions academic 'formality' as another factor that can create distance between some students and faculty staff. He also points out that unnecessarily formal approaches and inadequate direct communication from teachers and tutors can leave students feeling overwhelmed and isolated. Furthermore, Sax, Bryant and Harper (2005) confirm that quality (rather than quantity) of interaction with teachers is the most important factor in developing students' "academic achievement, goals, self-confidence, well-being and attitudes" (p. 642). This highlights the significance of university teaching staff in generating 'self-confidence and motivation' among under-represented students; it indicates that addressing the students' learning issues is what permits staff to gain students' trust and engender feelings of acceptance (Thomas, 2002, p. 432) which will lead to stronger student engagement.

3.2.2 Understanding students' social interactions and relationships

It is often argued that students have their own preferred approach to social interaction and communicating with others, and for this they maintain a social network shaped by their choices, comforts, and needs. Their social experiences in university mostly depend on how they construct their networks – for whatever reasons – and on how they place themselves in these networks. For example, most students tend to mix with groups comprising others of a similar age, attitudes, social class, financial status and other dispositions. Involvement in these groups helps students to feel 'connected' with wider communities on campus. Lairio, Puukari, and Kouvo (2013) argue that university is an important time for young people to develop social relations, and those students' social interactions and sense of belongingness are important factors in shaping their experiences of higher education.

One salient outcome of massified higher education (that is, higher education geared to the mass provision of teaching) is that it intends to include students from diverse social, cultural and economic statuses by providing customized learning opportunities suited to individual needs. For example, a person can return to his/her incomplete education after an interval of several years and can enrol in a course that would offer flexible class time, 'soft' course requirements, and other facilities all targeted at aiding them in completing their degree. In massified HEIs it has been claimed that under-represented student groups are significantly benefitted by the university system. Since difficulties in maintaining academic and non-academic relations vary between students (Bowl, 2003; Shevlin, Kenny, & McNeela, 2004), most of the studies regarding under-represented students emphasize mainly the "tension in both their internal and external relationships and social experiences" (Keane, 2009, p. 86). For example, some empirical research indicates that alienation is experienced by mature and lower socio-economic groups (Bufton, 2003; Weil, 1986) because members of these groups are burdened with many personal, family, and employment related responsibilities. These responsibilities in turn conflict with their university life. Moreover, part-time students have insufficient sense of belonging in comparison with full time students (Kember & Leung, 2004). International students struggle to fit in socio-culturally, and encounter problems in verbal communication that result in solitude and isolation from their social setting while at university (Robertson, Line, Jones, & Thomas, 2000).

In commenting on these studies about under-represented students, Keane (2009) claims that too little emphasis has been placed on investigating under-represented students' experiences, particularly their 'relational reality' (p. 86) within or outside HEIs. She therefore focussed on students' relationships with academic and non-academic peers, their attitudes in internal and external groups, and the difficulties the under-represented students find in dealing with different levels and groups of students. Keane (2009) claims that in reality the under-represented students in HE experience different incidents (i.e., disruptions, over-participation and over-speaking by peers during lectures, staring at, and suspicious behaviours) in academic and non-academic settings. She also emphasises the necessity of diversity and inclusiveness in higher education to mitigate the tensions the under-represented students encounter in interpersonal relationships.

Many of these studies indicate that two contrasting issues are evident in student experiences, and these issues have opposing impacts on students. It is understandable that students who leave home for higher education feel homesickness, particularly the 'freshmen' or first-year

students, as they find new sets of people, environments, relationships and responsibilities in HEIs. It is expected that students overcome 'missing home' within a few weeks of enrolment, and that this is achieved by self-disclosure of loneliness, frustration and depression (Bell & Bromnick, 1998) to friends, and by establishing a sense of 'belongingness' in relation to different aspects of campus life. It can be claimed that this sense of belongingness at the university and the state of homesickness have opposite impacts on students. Although these issues are not acknowledged as primary reasons for persistence or departure from any program, some researchers (see Berger, 1997; Morrow & Ackermann, 2012) have credited a 'sense of belongingness' as increasing students' intentions to persist towards completion of their studies. A comprehensive 'we' feeling among all the elements of the experience of higher education – including peers, faculty and staff, other student bodies, the institutional environment, and the system as a whole – could be designated under the wider concept of 'sense of belongingness'.

Morrow and Ackermann (2012) are keen to determine the importance of belongingness in terms of peer support, faculty support, and classroom comfort that situate students in a bonded community, and which later positively impacts their desire for continuation. Similar sentiment has been echoed in research that acknowledges the significance of students' belongingness in regard to academic motivation. Such research explains how students' sense of 'belongingness' in a particular classroom can be generalized to the wider institutional/campus context (Freeman, Anderman, & Jensen, 2007).

On the other hand, Tognoli (2003, p. 36) quoted Fisher and Hood (1987) to define homesickness as a "complex cognitive-motivational-emotional state" that engages a person to be always thinking about home and old relationships. He explores experiences of homesickness caused during the transition from living away from home, and the key issues related to adapting to a new residential situation. His research supports findings of Fisher, Murray and Frazer (1985) and Brooks and DuBois (1995) that claim the impact of homesickness varies depending on the geographical distance from home. When the home is closer to campus students are more likely to discuss their issues related to this transition period and seek cooperation from family, which in turn helps them to confront the new situation more productively. Alternatively, the situation is the opposite when the home prior to university is much further away from campus. Added to this, the failure of first-year students to set up a social support network due to extreme levels of social anxiety has been

predicted as another cause of prolonged homesickness (Urani, Miller, Johnson, & Petzel, 2003).

Social class has been treated as a major factor in shaping social relationships and interactions between different students in higher education. It is claimed that social class generally limits students to interacting and creating networks with other students of an opposite social class. Keane (2011) focuses on the domain of peer relationships among students from the working and middle classes. She examines the relationships between middle class and working-class students and the experiences they gather, the behaviour they project, and their long-term benefits in maintaining their relationships. Of course, a distancing behaviour among these two classes of students might be either self-protecting or self-sabotaging. Keane (2011, p. 453) later argues that because of 'cliquey-ness' (exclusive grouping of friends depending on particular commonness), both working-class and middle-class students deliberately like to separate themselves from other social classes and that the underlying reason is solely self-protection. In this case students mainly select friends or like to spend time with those with a similar social status as it provides them social, emotional and mental support, as well as the impression they will be mixing in a group that understands them (Keane, 2011). Brennan (2002) argues that middle class students get above-average jobs because of their social network, whereas the working-class are involved in below-average jobs. Keane (2011) argues that social networks play an important role in higher education and future job market prospects, and supports Bourdieu (1986) in confirming that one's network of peers has an immense impact on shaping social capital.

Being selective in undertaking social interaction and involvement in only a similar class group has significant consequences for students' experiences. Soria and Bultmann (2014) claim that working-class students usually struggle in integration and social engagement in higher education, and it is difficult for them to find peers who have the same life history and background. Additionally, these students spend less time in collaboration with their classmates in comparison to upper and middle class students. They are also less involved in group activities and students' clubs.

Social class background is significantly related to the students' sense of belonging at their place of academic study. However, it later affects the student's social and academic adjustments as well, as he/she finds difficulties during their studies and group activities (Soria & Bultmann, 2014). Overall, the working-class experience can affect students' retention, graduation, and other related matters. Working-class students often feel that they do not

belong to the university, in contrast to their peers from affluent families (Gevertz, 2014). They claim to face discrimination, criticism, and degradation from their wealthy class fellows for not 'fitting in' to university. This eventually results in their isolation, marginalization, and alienation (Soria & Bultmann, 2014) in higher education.

A sense of exclusion from the wider university community can be generated by a variety of factors. Aries and Seider (2005) suggest first-generation students from low-income families develop a sense of exclusion due to a feeling of inferiority stemming from insufficient cultural capital in comparison to their counterparts. They consider their parents' low-income jobs and lesser educational qualifications to be responsible for their social disparities in college. Possibly due to this feeling of inferiority, Aries and Seider (2005) found that students experience difficulties in adjusting and interacting with affluent/rich students. Low-income class students' sense of inadequacy and exclusion creates a feeling of powerlessness in comparison with affluent students, both in planning as well as in achieving career goals. Aries and Seider (2005) also point out that these experiences vary depending on the nature of the college (i.e., elite or state). In 'state' colleges in the USA, a majority of students come from a similar social class (mostly from low-income families) and accordingly their class-based identity and its consequences are similar. These students are not overly concerned about high status, expensive lifestyle, and cultural capital. Conversely, students from low-income families at renowned/elite private colleges usually feel disparity originating from a perceived inadequate social capital and financial wealth. These students experience tension in trying to equate their previous identity with their transforming identity at their HEI.

3.2.3 Students' retention and withdrawal

Considering the evidence that student experience plays a significant role in students' overall development and may enrich their campus experience, it is worth exploring the academic impact of such engagement, particularly on the retention of students. Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008) investigated the connection between first-year students' engagement and two other issues, namely academic achievement and continuation. Their research is primarily concerned with exploring the specific effect of HEI engagement on students' study results, with a specific focus on those students having different racial and ethnic backgrounds. Students who are socially and academically more involved and committed to campus activities have significantly better retention records (Morrow & Ackermann, 2012). Austin (1984) (in Morrow & Ackermann, 2012) also stated that students

who invested more time and energy in university activities were less likely to leave prior to study completion.

Although the prevalence of withdrawal is still significant in higher education, Thomas (2002) argues that students are continuing their study despite confronting critical barriers like financial constraints, the burden of loans, employment pressures and so on. Unlike most of the studies on retention issues with students in higher education, her particular interest is to draw out the role of 'institutional habitus' (p. 423) on retention of under-represented students, which has otherwise been insufficiently explained in the literature. To be explicit, she claims that some institutional provisions (for example staff relations, teaching, learning and assessment) can prevent students from leaving early. On the other hand, students' early departure from university is often evident in the literature (see Robertson et al., 2000) where it has been claimed that the feeling of not being confident in communication leads to isolation which eventually causes dropout among the particular class of students.

3.2.4 (Re) Formation of student identity

Social relationships can be significant in shaping a person's perception of their surroundings and the context she/he belongs in. An individual first begins to construct identity from their family by learning values, roles, and expectations which later enable them to assimilate into a broader social context and find their own social role and identity. While relationships with parents, friends, partners, family and neighbours can lead to a 'successful' adulthood and develop personal identity (Adams, Berzonsky, & Keating, 2006), university culture, educational responsibilities, scientific thinking skills, relations with peers, as well as other aspects of higher education develop one's academic identity (Christie, 2009), as students are required to re-form their 'self-identity' according to the academic, social, and/or professional context of higher education.

Considering this, Lairio et al. (2013) critically analysed how students perceived their life at university and its role in constructing their identity and developing their professional expertise. Their core concern was to understand students' individual points of view regarding their student life and their perceptions of identity construction. Lairio et al. (2013) argue that a students' life in university plays a vital role in constructing their personal, academic and professional identity. Adams et al. (2006) also recognise the value of a broad social environment which provides preliminary ground for individuals to shape identity. Every new

student in university experiences the challenge of re-considering their previous identity (Lairio et al., 2013). Perceptions about social and cultural values in professional life, commitment to work, and ethical considerations, are all developed as professional identities as Lairio et al. (2013) found in a study of final-year students who were about to start working life.

Scholars perceive the term 'social identity' as a context, a level of cognition and as including any of the behaviours of a person that helps to provide an understanding of the way in which they perceive themselves socially (Ashforth, Harrison, & Corley, 2008; Bliuc, Ellis, Goodyear, & Hendres, 2011). Therefore, it is necessary to investigate the development and (re)forming of students' social identities in a higher education context, and the impact of this (re)forming on students' choices of learning approaches. Bliuc et al. (2011) sought to uncover the impact of students' social identities on learning approaches and how this social identity relates to academic achievement. They also point out that students with a strong social identity choose a 'deep approach' to their learning, involving holistic and thorough understanding of learning materials, aids and related papers, exploring links with previous learning, and a focus on achieving 'knowledge' rather than to pass examinations. On the other hand, students with a less well-formed social identity tend to choose 'surface approaches', as they only want to pass the paper (or their exams) as opposed to achieving very high marks (p. 569). It is also evident that a deep approach to learning (more insightful, serious, enthusiastic) is associated with a strong connection between the social identity and academic achievement of a student (Bliuc et al., 2011).

Unlike other prominent research on students' academic engagement, the study by Stokoe et al. (2013) went beyond the traditional approach in investigating the classroom and formal educational setting. Stokoe et al. (2013) extended their interest to informal academic and non-academic "naturally occurring settings" (p. 76) such as seminars, student hostels, common rooms, libraries and social media messaging spaces. The authors agreed that the notion of 'student experience' is constructed by interrelated pedagogical and social contexts as it is "difficult to disentangle other life experiences from people's experiences as students" (Baird & Gordon, 2009, p. 195). Therefore, Stokoe et al. (2013) used an approach which considered the students' own way of living their life, rather than focusing on any pre-determined theory or classification. In doing this they asked: What is the relationship between the students' academic and non-academic lives? What is the meaning of being a 'student'? What kind of academic issues seem more interesting to students? How would they like to demonstrate their

knowledge and achievements in wider society? And, what measures do they take to fulfil their degree requirements? Exploring students' everyday lives, Stokoe et al. (2013) revealed that most students pay less attention and importance to their assignments and expend minimum effort on developing academic skills, and also discourage others who are sincere in their tasks and intend to develop their academic performance.

Understanding the reality that students in higher education are required to re-construct their previously shaped identity, Holdsworth (2006) investigated how students' residential status (staying at home or not) influenced their experiences in trying to "fit-in" to the university and in 'being a student' in higher education. Holdsworth (2006) referred to existing scholarship that asserts a diversity in students' experiences due to the enrolment of students from different class and ethnic contexts. For this, she compared the experiences of living at home and living away, and examined the outcomes of this residential status of students in shaping their identity as 'students'. In her words she looked into "how successfully they create a new habitus as a student" (p. 500). Holdsworth (2006) argues that, students' living status is an important reflection of their non-academic/social life and their construction of what she terms (drawing on Bourdieu) their student 'habitus'. The 'living at home' students tended to be active in university-based activities with different sub-groups of students, but they were less satisfied with their social life than were 'living away from home' students. She also argues that making friends and preparing for the outside world are deliberate but not automatic processes where strategies are needed for developing friendships and adjusting to university. This "fitting in" process, Holdsworth (2006, p. 495) says, can be supported through the experiences students have during the 'leaving home' status. When a student leaves home they experience and acquire more cultural capital. This helps them to integrate more easily than the local students who attend university (Holdsworth, 2006).

Indeed, the issues regarding identity transformation and re-shaping are not unproblematic. Students may struggle significantly during this phase, particularly at the beginning of their enrolment. To help them adjust in this situation, it is important to understand the specific reasons behind first-year students' identity problems during their transition to university. Scanlon et al. (2007) examined the losses that ensue when an identity transformation seems inevitable for the first-year students as they adjust to new social networks and their new academic identity. Reviewing the literature, Scanlon et al. (2007) created a logical argument for why transition is difficult. They argue that students' dependency on their previous 'knowledge about' university (a term coined by Schutz, 1964) is not sufficient, for this prior

knowledge offers an incomplete resource for their new learning context at university. This is one of the main reasons for their identity crisis at the beginning of their university journey. As a result, students remain unable to attain the necessary resources that can help them to cope with the transition successfully, and to adjust to their new learning situation (Scanlon et al., 2007).

Class based explanations of challenges during transition are prominent in the literature. Aries and Seider (2005) discussed the role of the class-based context in college students' identity formation. They argue that the social class context significantly influences low-income family students' identities, including thought processes, communications, daily living, interactions on campus, and their overall college experiences. They (2005) verified that some new students were tense and harboured fears about adjusting to their new learning situation and the unfamiliar nature of the struggle they would need to undergo in HEIs. Additional to this, students from low-income families were burdened with other barriers stemming from their limited 'economic' and 'cultural' capital – a problem not evident in students from wealthy families. In summary, through the lenses of economic and cultural capital, Aries and Seider (2005) represented the contextual barriers to a robust transition from school to college associated with social class in both elite and state colleges.

3.3 Issues emerging from student experience literature

The leading focus of student experience literature is in how students 'fit-in' in higher education institutions, particularly in regard to external and internal issues such as students' involvement, class and identity, social relationships in academia, institutional practice, and facilities. From the arguments detailed in the previous section, it would seem important here to draw together some emerging issues relevant to this current PhD research.

There are some indications in other studies that social class, parents' education, family income, and social and cultural capital transferred from families are factors that have consequential outcomes for students' higher education experiences. Garner (2013) confirms that students from working-class backgrounds have different experiences from those of middle-class students. He further states that students from a solid financial background often easily obtain the facilities that students from low-income working-class families cannot afford. This confirms that families are the most significant actor in shaping students' understandings of reality and identity. If a student's family remains unable to satisfy the

student's need for both economic and non-economic resources, then the student is more likely to struggle with institutional activities and practices and remains vulnerable when it comes to completing their education.

The level of parental education is another concern as it relates to the non-economic resources (e.g., social capital) of students. Some scholars argue that due to the inappropriate transfer of social capital from family, first-generation students are significantly lagging behind in cognitive development and obtain lower scores in different competitive assessments (Pascarella, Pierson, Wolniak, & Terenzini, 2004; Riehl, 1994 cited in Soria & Stebleton, 2012). Low family income and parental education both negatively impact students' experience, as, according to Engle and Tinto (2008, p. 21), "low-income, first-generation students not only face barriers to their academic and social integration, they also confront obstacles with respect to cultural adaptation. This is due to differences between the culture (i.e., norms, values, expectations) of their families and communities and the culture that exists on college campuses". From the literature cited it is apparent that both students' socio-cultural and economic backgrounds play influential roles in their experience of HE. Therefore, in any discussion regarding students' experience in higher education, there should be a focus on these issues.

Social relationships also exert powerful impacts on students' university experiences, particularly in establishing networks that provide resources to sustain them on campus, and aid in avoiding feelings of isolation and inferiority, and in assisting students in feeling they belong within a diverse community. Students typically feel stress and suffer adjustment issues at university as they confront new challenges, such as study demands, personal issues, financial constraints and a lack of social and cultural capital. Less family support (particularly when students live away from home) mitigates against academic inspiration and attendance (Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996), and can also be causes for inadequate academic engagement, which in turn works against students' development and success. However, with effective social bonding with other individuals, groups, and the institution, students have a mechanism for overcoming these difficulties. For example, peer networks can play supportive roles in helping a friend who cannot disclose his/her particular problem to others, even their family. There are some occasions where senior students can provide substantive advice from their experience regarding particular issues. The networks of family, friends, peers, and senior (mentoring) students can significantly ease the complexity of living and learning in a university. New emotional ties to the current place (the campus),

secure social networks and a functioning engagement with the surrounding community can help to reduce issues that cause isolation and withdrawal (Tognoli, 2003). Therefore, new relationships, new involvement and social interactions are very important for students at HEIs, particularly when, as part of an under-represented population, they are vulnerable to feelings of exclusion, and may be unable to (re)shape their identity due to pre-existing social and financial conditions or backgrounds.

How an institution perceives the diverse nature of students on the campus and what values are derived from the institution's policies and practices are the most widely researched topics that are discussed in student experience literature. Thus, a higher education institute should not be considered merely as a place of knowledge creation and dissemination, but should also take on the role of addressing other student needs (scholastic and non-scholastic) during these students' tertiary education.

Universities have an obvious role in shaping new 'student identities' and nurturing students' socio-cultural characteristics by promoting inclusiveness and being welcoming of 'difference' in all university activities. Most universities are replete with students from different social and economic classes, races, genders and backgrounds. Therefore, it is not surprising that students require an accommodating environment. There is evidence that students withdraw from active participation in university activities, as well as prematurely withdrawing from their studies. The question is, what can institutions do to help students avoid these pitfalls?

Thomas (2002) argues that institutions need to cultivate friendships and social networks that are beneficial to students and reduce the effects of unpleasant or stressful experiences – the experiences which often lead to early departure from higher education. Institutional social networks would also be effective in bridging students' old and new networks (their home and their university), and it would be this bridging which eventually qualifies students to 'replace or complement' (Thomas, 2002, p. 436) all aspects of university life in order to fit-in to the institution. Institutions need to strive to create learning systems where students can feel 'connected', systems that can help in avoiding isolation and early withdrawal. With a diverse social network that connects all students, universities can really provide students with appropriate and functional experiences.

Staff and faculty have important role in shaping students' experience, particularly experiences in coping with academic difficulties. Representing the HEIs, teachers can

influence students' identity (re)formation, their active engagement in class as well as in extended campus activities, and, most importantly, their acquiring of necessary motivation and confidence as a student of that institution. A first-year student initially feels some adjustment issues. They are at risk if they are members of an under-represented group. Moreover, linguistic differences and the differences in experience with formal vocabulary and grammar (see Baxter & Britton, 2001) of many students from lower income families also pull them back from sharing/expressing their ideas or interest in front of class and from feeling comfortable in formal academic environments. Part of the problem is that they fear they might be stigmatized as less intelligent for their speech (Aries & Seider, 2005). Teachers can help provide alternatives to these feelings of inferiority by gaining students' trust and by being accepting of students – despite their 'shortcomings' – and dealing with them in the same way they would deal with other students. If students feel respect and cooperation from academic staff, they are more likely to voluntarily share their problems with them and seek their counsel (Thomas, 2002). Issues of faculty respect and trust are significant for under-represented students, particularly students with disabilities, students of a low-income background, or those lacking in social relationships, as these factors often lead to a feeling of inferiority which they perceive as setting them apart from their peers.

The role of staff and faculty interaction in enhancing student experience is considered to vary according to gender. Sax et al. (2005, pp. 654-655) claim that

> men's and women's interactions with their faculty do not produce a uniform pattern of effects. Although many commonalities exist in terms of the role played by faculty, gender-based differences were observed across several dimensions, including political engagement, social activism, gender role attitudes, and physical and psychological well-being.

Therefore, in social and cultural contexts where gender is a significant issue in participating in higher education, it is worth exploring difference/variance in faculty interaction in relation to gender, and identifying how this impacts on students' university experience.

3.4 Framing the principal emerging issues and mediating factors explicit in student experience literature

After the foregoing analysis of the literature on higher education students' experiences, four principal issues were identified as providing a suitable theoretical base for designing the

current research and discussing its findings. These four emerging issues are to do with: *'Student identity', 'Social relationships', 'Institutional practice'* and *'Faculty and staff'*. The last two issues complement each other forming an extensive single issue, as faculty and other staff are contained in the institution itself, and the existing practices of an institution determine the nature of the relationships between students and the faculty and staff. However, exceptions occur when some faculty and other staff build relations that exist apart from their institutional practices. Nevertheless, the two issues, '*Institutional practice'* and *'Faculty and staff'* will be presented separately as they contain different components which affect the 'student experience'.

The significance of the mediating factors which shape '*student identity'* has been discussed in several studies (e.g. Aries and Seider, 2005; Engle and Tinto, 2008; Lairio et al., 2013). The educational status of the parents assists students in adapting to the new environment of an academic institution, and contributes to the construction of their self-identity as a student of that institution. Again, the socio-economic status of a family develops the sense of social class to which students gravitate, and helps shape their attitude to class. For example, their background influences whether students consider themselves as part of the dominant (or wealthier/more entitled) class, or whether they see themselves (because of the behaviours and practices existing within their families) as 'imposters' or as being 'unfit' for university life.

Many students attend university with incomplete understandings of the processes of teaching and learning at universities – and they face challenges and may feel powerless, and even entirely incapable of being able to meet expectations within the rigorous learning environment they now face there. Living circumstances also play a role in shaping the identity of higher education students. As the university environment is a new one for the students to face, it is an unknown factor. So too is a 'living on campus' situation. The effects of being thrust into such an environment have been emphasized in the context of understanding the university system and its role in re-shaping a suitable student identity. As shown in Section 3.2.4, it has been observed that students living constantly in a university – whether in students' halls or other student accommodations – are enriched with different kinds of student experiences in comparison to the students still living at home and commuting. Living in university accommodation can help students to have constant access to both academic and non-academic resources. This is not the case for students who live at home because of the necessity to return to their residences at the end of the day, as well as because of the distance they live from the university. It can certainly be said that there is a

difference in the learning and living experiences of students living in the residential halls and those who do not.

Students' ability to relate socially may affect how likely they are to find themselves in enriching social networks. Those with strong relational possibilities will have a better chance of realizing or finding their position in university, and a better chance of strengthening their self-identity and adapting to the prevailing practices at a university campus. A noteworthy benefit of healthy '*social relationships*' is that they assist students in acquiring social capital, by which they can achieve the skills required to place themselves in surrounding contexts. Every single student enters their university life with some networks of communication such as those involving family members, or other employees they work with at a part-time job, or within their circle of friends or in their involvement in community or sporting groups and clubs. At universities, new relations are formed with classmates, people they meet in university clubs or residential halls, as well as with university teachers, administrators and other staff. As well as this, the use of social media has also become a prominent means of communication.

From various studies discussed in this chapter, it is evident that as students remain involved in various social networks, their sense of belongingness develops among themselves, creating the scope and space for sharing emotions, feelings and opinions. Even when academic needs or frustrations manifest themselves – requiring consultation or co-operation in different stages of their learning and/or living – students can seek solutions by utilizing this network; it enables them to obviate the obstacles resulting from isolation, withdrawal and a feeling of inferiority.

Various studies indicate that aspects of university life such as the existing rules and conventions, culture, facilities, and the university 'atmosphere' influence the higher education experiences of students. According to the nature of *'institutional practice'*, students become motivated to participate effectively in various campus activities, otherwise they feel detached. For instance, a first-generation student from a low socio-economic background may feel more 'connected' with the 'institutional practice' when they find that their dispositions are being accepted, and their diversity is welcomed in the university. Moreover, the presence of spontaneous and co-operative relations amongst senior and junior students also enriches students' social networks. Enrichment has also been reported in the context of student connections with teachers and staff.

Finally, students will effectively participate in university academic and non-academic activities only when they feel respected, regardless of race-religion-ethnicity-colour-gender and socio-economic status. When they feel this acceptance and trust from those around them, they are more likely to fulfil their potential. Such respect and trust consolidate students' confidence. As a result, students no longer consider their existing dispositions as 'inferior', rather they become motivated and empowered in engaging with their new experiences at HEIs.

3.5 Theoretical approaches in 'student experience' literature

The aim of this section is to develop a working framework for the understanding of higher education students' social contexts for this current study. The work of Bourdieu is helpful in this regard. Bourdieu's theories and concepts are powerful means of explaining inequalities in higher education systems that are, in many cases, not so visible at first view. His conceptual tools also help educational researchers to focus their attention on contemporary modern university issues, and to make sense of students' – particularly underrepresented students' – differentiated experiences of everyday higher education. In this section various studies which focus on Pierre Bourdieu's writing about social capital and networks are presented, alongside the inputs of other researchers who also write on the topic.

3.5.1 Bourdieu's use of 'social capital'

Bourdieu (1997, p.51) perceived social capital as the "aggregate of actual or potential resources" available in an individual's social network created by his/her family, class, friends, school, tribe and so on. This social network is where a collection of individuals live and undertake their activities. The strength of this network, according to Botas and Huisman (2013), depends on "acquaintance, recognition, acceptance, obligation, and trust" (p. 744).

Bourdieu (1997), in his research, also focuses on how social networks are created in order to generate social capital for an individual. He argued that *conscious* or *unconscious* investment strategies an individual uses to establish or reproduce interpersonal relationships in society are contributing factors in creating such networks (p. 52). Thus, he points to each of us – both deliberately and unconsciously – having a significant role in our social networks.

Bourdieu's research and theories are supported and extended by other theorists. For example, while reviewing social network theories, Morosanu, Handley and O'Donovan (2010) distinguish between a 'constraining' or 'enabling' effect of social network research. To Morosanu et al., the 'social capital' concept mostly represents the latter dimension of social network. However, Coleman (1997, cited in Morosanu et al. 2010) does not see social capital as the mere outcome of relations. In extending further the concept of social capital he differentiates the resources (the capital) from each other and sees this capital as a competence achieved through membership in a range of different networks.

3.5.2 Social capital as an important aspect of HE experiences and engagement

According to Bourdieu (1986) and his social capital theory, knowledge and information achieved through social networks is very important in higher education, as this knowledge can be used to assist students in making useful decisions during the university studies. Students do not all have a large amount of social capital, however. Many students who do not have sufficient social capital might even be unaware of how important social capital is and the possibilities which arise from it. In this case Bourdieu makes the point that students with limited social capital experience difficulties in many areas. They are more likely to be reticent in seeking help from their university professors, and they usually lack understanding of what is required in their university assignments. Generally, they are less capable of fulfilling college obligations, which can lead to positive impacts on their future lives.

Many researchers support Bourdieu's (1986) concept of social capital. Among these are Soria and Stebleton (2012) who describe it as an outcome of social networking that provides students with "privileged knowledge, resources, and information'' (p. 675) to help them select from academic and social options available to them at university.

Based on the above, for any research on students' adjustment to their university life, it is therefore important to explore their social capital and the impact of this on their lives. Accepting the necessity for understanding social networks, Morosanu et al. (2010) perceive Bourdieu's social network approach as a suitable lens through which to understand how students in higher education use their self-constructed networks, combined with formally established networks offered by their university, to adjust to different challenges in academic and university life.

To understand the adjustments required of students during the transition into higher education, it is important to investigate the social relationships students are involved in, particularly their self-constructed ones (Morosanu et al., 2010). Morosanu et al. (2010) also detail another area deserving of research, and that is the students' perceptions of the educational supports available to them. For example, although the literature may claim that higher education networks are well stocked with effective resources such as 'advice and information, companionship and psychological support, academic knowledge and exchange' (p. 667), it is important to consider if students actually need these supports. In other words, how do they perceive the stock of support services impacting on their transition? Most importantly, how do they develop and use informal networks other than university initiated formal support services?

Considering this view, Morosanu et al. (2010) distinguish between 'naturally available' resources (for example, fellow students or roommates) and 'formal' resources (those arranged by university authorities) in stating their idea that "coping at university ultimately depends on students' own initiatives of seeking or using support from the pool of available choices" (p. 668).

Pascarella et al. (2004) also have much to say about social capital. They state that 'social capital' is a specific kind of asset which can be transacted and transferred from one person to another by means of mutual relations. Referring back to Bourdieu (1986) on this matter, they state that family can be is considered as a repository for versatile non-economic resources. Adding to this, Pascarella et al. (2004) argue that through mutual relations among members of families, they transact and transfer their resources among themselves in order to create positions of greater influence, and acquire the necessary skills for adapting positively within their social structures. It should also be noted that friends and peer groups increase educational aspirations by providing information regarding the 'hierarchy' of institutions, and by helping each other to decide where they want to be enrolled (Brooks, 2003, 2005).

3.5.3 The impact of family support

Bourdieu (1986) argues that students gain social capital from families. Similarly, Morosanu et al. (2010) point out that in relation to social capital it must not be forgotten that family and friends provide significant informal supports, such as, "guidance and feedback, non-directive support, positive social interactions, and tangible assistance" (Barrera, Sandier, & Ramsay,

1981, in Morosanu et al., 2010, p. 667). Others also comment on the importance of family, with Pascarella et al. (2004) pointing out that educated parents are a significant influence on shaping the experience of their children's education. Paralleling this, studies also indicate the plight of students who have only limited influence from their families. In this regard, Gofen (2009) considers the limited social capital of first-generation students with parents having no background in university education. He claims such students cannot achieve the required social capital from family and therefore struggle to find success in university.

Soria and Stebleton (2012), support Bourdieu's notions about the transmission of social capital from family, more specifically pointing to the impact of university-educated parents on students' abilities to acquire social capital and use this capital in developing personal skills and/or engagement in higher education. The authors claim that, although first generation students' engagement can be enhanced by other factors, their parents' level of academic qualification can play an important role in constructing their cognitive development as university graduates. As such, Soria and Stebleton's study and others have found that first generation students, in comparison with non-first generation students, tend to have limited experience of academic engagement such as dialoguing with faculty members, participating in group discussions, generating new ideas, class participation and creating insightful examples or questions (Soria & Stebleton, 2012). It was also reported that first generation students lag behind in cognitive development and obtain lower scores in different competitive assessments (Pascarella et al., 2004; Read, Archer & Leathwood, 2003). Soria and Stebleton conclude that limited social capital and less supportive family sources of academic inspiration (Terenzini et al., 1996) can underpin inadequate academic engagement.

3.5.4 Higher education institutes and class inequality

Bourdieu & Passeron (1977) criticise higher education institutes for fostering class-based inequalities. Keane (2011) supports this contention, stating that social class-based differences are evident in students' higher education experiences, where participation, 'survival', achievement of desirable development, and the expectation of future employment of the students from lower socio-economic backgrounds have been massively affected.

Keane (2011) explored the differences between middle class and working-class students in an Irish University, focusing particularly on the pre-set views and behaviours of both. Keane (2011) states that students from both classes maintain their self-perceived social positions by

employing intentional 'distancing' behaviour. She describes two types of this distancing behaviour. First is "subservient distancing", where students withdraw themselves from a position/situation that they perceive as 'higher' than their own social position. The second form of distancing behaviour she labels as "status-maintaining/raising", and this occurs when students create distance in order to indicate a superior status (p.453). Keane (2011) states that both these distancing behaviours help students to protect their self-perception about social positioning: a working-class student does not want to reveal their fear of humiliation, while their counterparts seek to raise others' perceptions of their 'supremacy'.

Thus, working-class students, in the context of their socio-economic status, consider themselves to be more servile because of this inferiority complex. They do not intend to interact with middle or upper classes and are reluctant to take part in diversified activities in the university. Among these learners, another trend appears to be prominent – they feel comfortable in mixing only with the students in their classroom who belong to an equivalent or similar class.

This practice is a reflection of their thoughts. Students tend to think – both consciously and unconsciously – that others with a similar socio-economic status are more accepting (Keane, 2011). As a consequence of this thinking, student groups form on the basis of social class and financial capacity, and students feel comfortable keeping themselves confined to these groups. Students thus start to consider themselves as members of an isolated social class. They are not eager to build social relationships outside their 'self-perceived' social class, as they think that interaction with students from higher classes might result in negative outcomes. Keane is of the opinion that these students deprive themselves of the benefits of a wide variety of activities in their universities due to their 'sticking to their own' attitude, which results in unvarnished university experience from their perspective.

Furthermore, social connection with one's classmates is an essential element of social capital (Bourdieu, 1986), and it has been claimed in some studies that there is a nexus between social capital and future employment. Criticizing this concept of retraction, Keane (2011) suggests that cutting ties with middle-class students leads to significant loss for students belonging to the lower socio-economic classes, especially after their graduation when they seek to enter into professional careers, but find themselves incapable of transforming their academic credentials into economic capital due to their insufficient social connections. Thus, it is posited that Bourdieu's concept of social capital may largely influences a student's progression to, within and beyond higher education.

In exploring this same situation, Devine (2004) describes two mechanisms through which social capital operates to influence students' progression to higher education. One is the network built consciously by middle-class families with other middle-class families to ensure their children share in groups with children of other educated and 'solvent' parents (those in a financially positive situation). This networking is done in order for these students to feel both pressure to perform better in educational institutions (and the expectation that they will) and therefore become eligible to enrol in top ranked HE institutions. The second mechanism Devine (2004) describes refers to middle-class parents receiving information about HE institutions through these networks. Both the parents and students receive the privilege of obtaining information and advice about the quality of various HE institutions, and consequently they are well equipped to make decisions based on relevant information and recommendations. Devine (2004) also observes that these two mechanisms are largely unavailable to the parents of lower socio-economic backgrounds.

Therefore, privileged students receive information about HE institutions from multiple sources due to their social networks familiar with HE. On the other hand, underprivileged students do not have this facility (Brooks, 2008). Based on this, Brooks (2008) established her argument that social capital plays a significant role in students' progression to higher education. Brooks also focuses on the fact that the existing system of compulsory and non-compulsory forms of education create inequalities on the basis of social and cultural capital.

It has been claimed that highly educated parents can assist their offspring in selecting suitable education options and conceptualizing them (Pascarella et al., 2004), and that these parents can also motivate their student children to participate actively in various activities at the university. In a different way, it can be said that parents can inculcate their acquired social capital into their children. These children enter their educational institutions after gaining a well-stocked knowledge of relevant resources from their families. As educational institutions are responsive to the values, attitudes and disposition of the dominant class, at school these children tend to observe and carry on the practices of the same social and cultural resources they have known within their families (Scanlon, Rowling & Weber, 2007). As a result, they experience less difficulty surviving in their HE institutions and participating in a variety of activities there.

A child of these better educated parents "encounters a social world of which it is a product, it is like a 'fish in the water': it does not feel the weight of the water and it takes the world about itself for granted" (Bourdieu & Wacquant, 1992, p. 127, cited in Thomas, 2002, p.

423). Opposite to this, 'first-generation students' attend institutions having few preconceptions, thus experiencing difficulty in adapting to the morals and practices existing within their university. As the universities are administered in accordance with the needs and dispositions of the dominant class, first-generation and under-represented students have less confidence. As a consequence they retract themselves, feel reluctant to participate, and are more likely to leave before completion (Soria & Stebleton, 2012; Thomas, 2002). Those who somehow manage to survive their HE experience and complete their studies come out with lower levels of intellectual competence (Soria & Stebleton, 2012). They also remain unsuccessful in reaching the expected level of psycho-social development.

3.5.5 Critiques of Bourdieusian social capital

Brooks (2008) states that some researchers have opined against the influence of social capital on access to higher education. Others have agreed that social capital might have limited influence. Brooks states that there are significant limitations to Bourdieu's theory as a tool for explaining existing inequalities between students, as well as in helping us to understand the reason behind and nature of these inequalities. She recognizes that for students all over the world, particularly in countries using a neo-liberal ('free market') education system, accessibility to higher education has increased significantly. She states that youth in many countries consider the option of higher education as a means of securing their future career and livelihood.

On the other hand, Brooks (2005) also focuses on the fact that access to higher education is not equal for all. In support of this argument, she mentions the special initiatives taken by the governments of various countries to ensure enrolment of students from 'non-traditional' groups in the top-ranking colleges and universities. Again, Brooks (2005) claims that higher education is a choice for the youth who enjoy access to it and it is a fact all over the world that youth are more inclined to this choice.

Brooks (2008) also mentions various studies which have established the significance of 'choice' in the lives of youth in the contemporary world. She claims these studies indicate that the choices youth make do have a significant effect on determining whether students will pursue higher education or not, and which university they will choose for their tertiary education. However, Brooks (2008) also states that students' choices are highly influenced by their class, gender and ethnicity which indicate that inequality is predominant in HE

institutions and the origin of this inequality lies within society itself. Therefore, according to her, Bourdieu's theory of social capital is able to explain and analyse HE inequality, and how it shapes students' access to higher education.

In the context of this research, the critiques do not limit the scope of the study; rather they pave the space for enriched discussion on the inequalities and the argument for an equal opportunity for all in HE.

3.6 Disabled students' experience of digital technology in higher education

3.6.1 Digital technologies for students with disabilities

This section now introduces the specific topic of the thesis through which these issues of student experience will be explored – digital technology. In a basis sense, digital technologies encompass computer hardware (such as laptops, tablets, smartphones and other digital devices, alongside 'peripherals' such as printers, scanners, webcams and similar), alongside computer software (notably online systems, platforms, application and specific software such as the word-processors, games and so on). The rise of the worldwide web since the 1990s have given rise to internet search engines, email, social media and other forms of information retrieval, content sharing and communication. More recently, the growth of smartphone-based 'apps' has introduced the idea of mobile forms of access to digital services. In total, a range of digital technologies are now present in the lives of all university students.

In particular, the past twenty years has seen a steady growth of technological provision for disabled university students. As such, while variations in individual motivation, expertise and amount of usage are acknowledged (Wald, Draffan, & Seale, 2009), it is increasingly claims that disabled students are becoming part of the 'digital native' generation. Since HEIs have adopted various forms of digital technology to support key academic and administrative functions, it is reasoned that disabled student communities now need to be able to access and use digital technologies in order for there to be a basic equality of opportunity. As such, it is now expected that disabled student are able to make good use of university platforms, learning management systems and intranets to access learning materials, communication media like mobile call and short text, email, and other online service. In addition to these generic technologies, it is also expected that disabled students are able to make good use of appropriate assistive technologies to compensate for specific needs arising different disabilities in order to benefit from these core university technologies. As such, it is also Hasselbring and

Glaser (2000, p. 102) content, this combination of mainstream and assistive university technologies not only "…facilitate a broader range of educational activities to meet a variety of needs for students with mild learning disorders, but adaptive technology now exists than can enable even those students with severe disabilities to become active learners in the classroom alongside their peers who do not have disabilities". .

3.6.2 Specialist technology used in HE by disabled students

Against this background, disabled students' access to – and use of - digital technologies needs to be seen in pedagogical and institutional terms, as well as being a technical phenomenon (Draffan & Raingerb, 2013; Seale, 2013b). Alongside their use of the mainstream digital technologies just outlined in the previous section, are a range of specific assistive technologies developed to support students with disabilities to participate equally comparing to their non-disabled peers in the educational setting which increase their ability to success (Lewis & Harrison, 1988).

These assistive digital technologies may vary from different disabilities. For example, students with hearing impairments generally make use of Telecommunication for the Deaf (TDD) and 'Captioning' technologies. TDD assists people to type on the keyboard and to take message over the phones, while Captioning adds visualization of spoken words in the form of text. Live Captioning technology therefore supports inclusion of students with hearing impairments in regular class settings.

Elsewhere, students with visual impairment often make use of Descriptive Video Services (DVS) that show verbal descriptions of visual content, whereas Close Circuit Television Magnification (CCTV) helps to expand text or graphic content the help of zoom camera technology – capable of expanding text and images up to sixteen times the actual size. Another widely-used technology is Optical Character Recognition (OCR) - a computer centered application which can scan and read text with sound – as well as Braille note takers that can store and read text aloud (Fichten, Asuncion, Barile, Fossey & Simone, 2000).

In terms of students with physical disabilities, technologies such as adaptive keyboards and Touch Sensory Screens allow students to engage with computers in ways that fit their mobility and movement capabilities (Hasselbring & Glaser, 2000).   Similarly, a range of technologies have been specifically developed for students with dyslexia (Draffan, Evans & Blenkhorn (2007). These include digital recording devices, handheld spellchecker, scanning

and reading pens, and portable note takers. Alongside these hardware provisions is speech recognition software, text to speech systems, online talking dictionaries; concept mapping, and word prediction software help such students to do their academic tasks effectively.

3.6.3 Disabled students' experience of using digital technology

In theory, all the digital technologies just outlined are now used in universities to support students in their academic studies and the social elements of their university experience. That said, in practice, research shows students' experiences of using these technologies to vary considerably according to context and circumstances. As the empirical aspect of this thesis is focused on, it is important to consider the actual experiences of students in engaging with these technologies during their university careers. As might be expected, different students with disabilities are likely to have a variety of experience even when in the same classroom setting (Sharpe, Benfield, Roberts, & Francis, 2006).

For example, research by Wald, Draffan & Seale (2009) detailed the initial challenges faced by some disabled students in using technology for their learning - especially when commencing their studies. While able to engage in basic use of email and internet browsing, disabled students were less likely to engage with contemporary versions of software, and were less involved in collaborative use of less formal forms of social technology support – such as social media and other forms of online student community. This study also pointed to a trend for disabled students having to self-procure technologies in order to supplement their university's official technical provision. All told, it was concluded that disabled students continue to require addition time and support in comparison to their non-disabled peers if they are to stand a change of fully benefiting from digital technologies in their university studies.

Other studies have focused on the experiences of disabled students in engaging in online study and other forms of 'e-learning'. For example, research by Permvattana, Armstrong, & Murray (2013) raises the problematic nature of online study for students with vision impairments – especially the incompatibility of many online resources with students' assistive technologies leading to increased perceptions of isolation. This study also raised the issue of additional time and effort on the part of vision-impaired students to make rudimentary use of technology-based learning – a factor found to deter use of

'additional' technologies when studying such as social media (see also Wald, Draffan & Seale, 2009).

3.6.4 Impact of digital technology use

All of the technologies just described are widely considered to provide valuable forms of support to disabled students (Getzel, McManus & Briel, 2005). For example, Williams, Jamali and Nicholas (2006) point to the increased individualization and 'personalization' of learning content to best fit the specific demands and needs of different students, alongside the increased student control over the nature and form of their learning environment. Alongside these benefits, are opportunities for sustained communication between students and teachers on a more accessible asynchronous and/or multimodal basis, alongside the capacity of university staff to better monitor the learning progress of students, and allow teachers to plan and execute individualistic pedagogical provision to best fit the needs of each student.

In contrast, are a range of potential limitations and possible harm to disabled students' engagement in university studies. Perhaps most directly is the problems arising from lack of access to digital technologies in situations where it has been presumed that students have access to technology. A number of studies therefore point to the constraints faced by disabled students in terms of the scarcity of assistive devices, ageing technologies, , poor quality and faulty devices (McNicholl, Casey, Desmond & Gallagher, 2021). In addition, Skär (2003) highlight the social implications of choosing to engage with assistive technologies while studying at university – with some students reticent to be seen by their peers as disabled and/or requiring additional support. Skär (2003) points to differences in the take-up of assistive technologies between partially sighted students – many of whom are reluctant to make extensive use of assistive devices (see also Watson 2002; Aitchinson, 2003). This has led some researchers to point the possible 'stigmatizing' impact of using assistive technologies in educational settings (Hughes, Russell, and Paterson, 2005).

Other studies move away from this individualized perspective, to also consider cultural perceptions and influences on students' decisions to use and adopt assistive devices – ranging from issues of linguistic compatibility through to gendered expectations

(Abuzandah, 2021). Another significant issue highlighted by some studies the variable levels of training amongst university teaching staff for making use of assistive technologies, and supporting disabled students to make full use of assistive technology as part of their courses (Claiborne, Cornforth, Gibson & Smith, 2011).

3.7 Conclusion

Following previous chapters on literature relevant to this thesis, this chapter connects student experience to social context, and makes the point that student experience is very dependent on social capital – one's actual and potential resources – and that this social capital is very much influenced by class. It also makes the point that although they do not correlate directly with each other, class and social capital are very much connected. For example, students from middle- or upper-class families are more likely to have parents or siblings that are familiar with HE and university life, and it is these family members which may be a useful influence on students entering HE. Consequently, students from such a background – of having educated family members – are likely to have greater social capital: they are likely to have a greater collection of both actual and potential resources in their social capital and therefore more likely to have a more enjoyable and successful student experience of higher education.

This is the last of the literature chapters. The next chapter is the methodology chapter, and is followed by four findings chapters.

Chapter Four: Methodology

4.1   Introduction

This chapter outlines and justifies the research methods, tools and techniques used for this study, elaborating on why certain strategies are being adopted and utilized. The chapter explains why the interpretivist epistemological approach within the qualitative research paradigm has been used. The research also uses a case study approach, interviews and group discussions. As such – and following the lead of the Social Model of disability and the notion of social capital - this is an in-depth investigation of individual disabled students' thoughts, perceptions, experiences and practices of digital technology utilizing a qualitative research approach. Creswell (2014) describes qualitative research as exploratory in nature and sees it as appropriate when important issues are unknown to the researcher. Therefore, a qualitative approach is advantageous given the absence of prior studies and institutional data regarding disabled students' experiences in higher education in Bangladesh.

4.1.1   Outline of the methodology

It is important for researchers to carefully explore their research options (Egbert, 2005). Egbert further states that it is the researcher's perspectives that "determines the outcome of the research, what we perceive as important, the conclusions we make, and the implications we suggest" (2005, p.7). In discussing the research options further, she also suggests the use of different data sources such as interviews, observations and focus groups (2005).

The research questions of this research lend themselves to an interpretivist epistemological approach to research. In this approach the focus is given to the participants' interpretations of their experiences, and 'reality' is constructed with the help of the research participants (Robson, 2011), with the researcher following an inductive process to obtain knowledge without preconceived theories or prejudices (Corbetta, 2003). Both the researcher's and the participants' individual perceptions, thoughts, ideas and subjective meanings of social action are accepted and considered as relevant in interpretivist epistemological research (Bryman, 2012; Robson, 2011).

4.2 Methodology rationale

4.2.1 Qualitative research

Qualitative research involves the collection of rich data that are not number-based (Merriam, 1998). Qualitative research is an approach to research for researchers who do not want to be limited to what can be measured objectively or numerically (Richards, 2003). It is research that claims to delve deeply into human experience by going past what can be seen by observation and into what can be learned by seeking the thoughts and experiences of those being researched. Therefore, qualitative research focuses on human experience, and it is most appropriate for studying settings that are not well-defined and for focussing on the perceptions of those being researched (Richards, 2003).

It is an approach used to obtain detailed information using unique steps in data collection, analysis and drawing conclusions; steps that depend greatly on the skills of the researcher (Lichtman, 2013). It is an approach that is helpful in gaining an in-depth understanding of the points of view of the participants and, where relevant, an explicit understanding of central incidents (Kiernan, 1999; Trauth, 2009). In this latter example, the qualitative research method develops a critical analysis of events.

Qualitative research is also well-liked for its flexibility in exploring knowledge, and the applicability of its use is wide ranging. Creswell (2014) supported Guba and Lincoln (1994) in stating its value in a 'natural setting', its relevance to an 'understanding of central phenomena' and its usefulness when research involves only 'a few participants'. Consequently, in qualitative research the researcher typically explores a significant event or premise in a natural setting observing a few participants only.

Hatch (2002) and Marshall and Rossman (2014) praise qualitative research for the way it handles multiple sources of data, for its inductive and deductive data analysis, and for its reflexivity. Others recommend it for the holistic picture it paints in multiple dimensions of causes, effects and other aspects of central phenomena being studied (Creswell & Brown, 1992).

Creswell (2014) and Rubin and Rubin (2011) justify their use of the qualitative approach in research by stating that it focuses on the viewpoints of participants through narrative discussions. Trauth (2009) states it is effective in understanding intangible social issues like culture, norms, and the thinking processes and beliefs of participants, and then enabling interpretative analysis from the perspectives of the research participants (Hevner, March,

Park, & Ram, 2004). Further to this, it also helps a researcher to develop a conceptual framework based on the participants' life experiences (Millers and Huberman, 1994).

Conducting research with people with disabilities has always been difficult. However qualitative research –being conducted in natural settings – although it still has challenges, can be an effective means of working with people with disabilities. Sometimes, for example, researchers become biased in drawing conclusions (Swain, Heyman & Gillman, 1998). Finally, Kiernan (1999) states that with a qualitative approach it is more practicable to work with disabled people. Despite the many challenges, Nind (2008) argues that with the help of innovative techniques like visual supports, the qualitative approach is effective in conducting research with people with disabilities.

4.2.3   The case study approach

This study has adopted a multiple case study research design, based on but not confined to both semi-structured interviews and focus group discussions (FGDs). Since the scope of the study focuses on one specific university setting and a relatively small population of students, a case study design has been chosen to allow the study to explore the "complexity and particular nature of the case in question" (Bryman, 2012, p. 66). According to Yin (2009), the case study approach explores a 'contemporary phenomenon' in a real-life setting using more than one method of data collection. In this empirical study, it is the case study approach which is used to investigate a 'contemporary phenomenon' (i.e., digital technology) for a series of individual student 'cases' with a broader focus on the general educational and technological experiences of each disabled student for understanding "the wholeness and unity of the case" (Punch, 2014, p. 120). Data regarding this 'contemporary phenomenon' of 'case studies' was generated by various means including interviews, focus group discussions, and diarizing – a diverse group of means of data collection as recommended by Yin (2009) among others.

Yin (2009) defines case study research as an inquiry strategy that provides detailed descriptions of a phenomenon. Duff (2018) stresses that a case study approach uses multiple forms of data in order to view the topic and the data through various lenses in order to reveal many components of the topic being studied (Duff, 2018).

The case study has often been used to meet the needs of a holistic and in-depth investigation of a process, program or significant issue (Feagin, Orum & Sjoberg, 1991; Merriam, 1998)

particularly in social studies (Tellis, 1997a) and within a natural setting (Creswell, 2014). It enables a multi-perspective analysis in considering not only the oral data obtained from participants, but also all other relevant details of participants such as their gestures and vocal intonations (Feagin, Orum & Sjoberg, 1991). Where other methods of data gathering struggle to obtain details, the case study approach elicits detail through multiple data sources (Tellis, 1997b) including observation, questionnaires, interviews, and reading documents such as journals, media reports, and any other relevant written material.

Case study research can involve just one case, but is typically concerned with a small number of cases (Creswell, 2014). Not all researchers agree in defining a case study, however, Benbasat, Goldstein, and Mead (1987), for example, provide no specific definition of what a case study is in their research. They simply refer to it as an examination of a phenomenon in its natural setting.

As stated earlier, a case study may use a variety of methods to collect and analyse data. It is also usually research involving indefinite variables and boundaries (Tellis, 1997b). Benbasat et al. (1987, p. 371) offer a more comprehensive list of the characteristics of a case study. They state that a case study:

- Monitors variables in a natural setting;

- Provides multidimensional methods for collecting and analyzing data;

- Can provide in-depth consideration of a limited number of variables;

- Is concerned with valid cases;

- While focusing on contemporary events, seeks answers to "why" and "how";

- Requires the skill of the researcher to manipulate data analysis and drive results; and

- Allows for variables and site selection to vary from question to question or hypothesis to hypothesis.

When it is appropriate to use a case study, its characteristics allow the researcher to classify the study into specific sections. For example, Yin (2009) classifies case study into three parts. First is the exploratory component, where events need to be explored in order to gain in-depth knowledge. Second is the explanatory component for providing relevant information, events or theory. Last comes the descriptive component where, after completion of the other two components, aspects of the study are detailed or described further.

Yin (2009) also suggests that case studies are suitable for challenging or confirming theories and phenomena. While researchers such as Stake (1994) claim that case studies are best suited to testing hypotheses – even though they are very popular with anthropologists, psychologists and others who want to explain or develop a theory (Simon, 1969; Smith, 1974). Psychologists use case studies for individual case events. Business schools, product designers and sociologists use the case study model to explain their respective events (Creswell, 2014).

Lindlof (2009) and Stake (1994) suggest in their works that perhaps the most significant use of a case study is that it can be of benefit in even the most simple or seemingly trivial research, for it can bring significance to any phenomenon in its ability to obtain deep understanding about practical issues.

In research focused on topics relating to special education or disability, case studies are considered by some to be the most suitable research method as they are more person-centred rather than program or classroom-centred. This emphasis ensures an in-depth understanding about the skill development and actual progress of a disabled child, for example (Keiley, 2011).

When it comes to the number of case studies that a researcher wants to conduct, according to Benbasat et al. (1987), most researchers need multiple case studies in order to permit cross-case analysis and to extend a theory. The main focus of such 'multicase' studies is to characterise a number of varying events (Stake, 2008). A primary reason for conducting multi-case studies is that they identify different performances in different environments (Stake, 2008). However, synthesizing data from multiple cases can be very complex, particularly as it usually needs to be done by one researcher who becomes immersed in the data in order to squeeze all the experiences from it (Stake, 2008).

Creswell (2012), Patton (1990), and Yin (2009), point out that doctors, social workers and program evaluators, among others, are already known to their cases. In contrast, educators and social scientists need to 'choose' cases which should then be interlinked through a common idea or theme with cases studied by others. This in turn will influence significantly the critical analysis of data.

This study uses multiple case studies – focusing on 10 cases – to lead to better understanding of the particular phenomenon (digital technology) and the reality of the population (disabled students in HEI) in a particular context (Stake, 2008). Sometimes this approach is referred to

as a collective case study or comparative case study (Punch, 2014). In multiple case studies, researchers use the same or similar research questions and activities with all of the participants. Since one of the aims of this study is to explore the perceptions of disabled students regarding the impact/consequence of using digital technology, multiple case studies seem to be the most appropriate design for providing the researcher with the opportunity to view the research problem from various perspectives.

According to Robson (2011), the case study design typically involves combining multi-method strategy in the qualitative research tradition. This type of combination is typically acknowledged as effective for researchers in obtaining unique comprehension of the problem under study (Morgan, 1997).

A case study approach is very much a qualitative approach that uses multiple perspectives (Yin, 2009). It can be part of quantitative research, depending on the method of data collection, but data collection through open discussions and semi-structured interviews primarily lends itself to qualitative research (Baxter & Jack, 2008).

In case study research, many researchers prefer their case study participants to be a part of a pre-existing social group, where group membership is based on particular characteristics or status (Bloor, Frankland, Thomas, & Robson, 2001). The use of such a pre-existing group is considered to be advantageous in avoiding a stigmatizing situation which might arise after participants openly disclose their opinions, particularly where participants might generally feel comfortable in speaking openly to other such group members (Farquhar & Das, 1999). Farquhar and Das argued that this type of group also aids the researcher in recruiting recruit group members. This is the case if one of the first committed participants agrees to approach others in their social group with a request for their participation in the research.

In a pre-existing group, since the participants have prior knowledge of each other and they are from a similar context, they are also more likely to complement each other's views and opinions more sincerely (Bloor et al., 2001) and in a friendly and encouraging manner, especially with the assistance of an encouraging moderator.

4.2.4   Semi-structured interviews

The purpose of interviews is to gather descriptive information (Kvale, 1983). To do this, interviews used for collecting qualitative data can use either structured or semi-structured

questions (Creswell, 2012). In quantitative data collection, however, the interviews are almost always semi-structured.

Apart from being structured or semi-structured, interviews can be further classified according to whether they are face-to-face, or via telephone, messenger or email, etc. with the latter means of interviewing being much more popular in modern times (Opdenakker, 2006). While interviews generally have standardized questions (the same questions for each interviewee) and the answers sought are typically yes or no, short answers, and even ticking or circling options, in qualitative research the answers often sought to questions are open-ended. This means the researcher does not visualise in advance all the possible answers, and allows for the experiences of the interviewees to generate the type, length and amount of detail in the answers they provide. These are called semi-structured interviews (Gordon, 1975). Semi-structured interviews are 'open-ended', and help the participants to express their perceptions and opinions and thoughts – not just 'facts'. Such interviews also enable probing for more specific information (Opdenakker, 2006).

In 2002, Gubrium and Hotstein classified interviews as structured, semi-structured or unstructured. Creswell (2014) classified them as structured, guided, in-depth, casual or planned. In addition, contemporary writers like King and Horrocks (2010) suggest that interviews can be realist, contextual or constructionist – where each has unique characteristics, knowledge production, hypotheses and roles of the researcher. Sigstad (2013) states that a good amount of time is needed to conduct any interview so that the interviewee can understand the questions without any confusion. This is an important aspect of the interview as any kind of confusion regarding questions can manipulate the conclusions that researchers uncover through analysing the data (Sigstad, 2013).

4.2.4.1 The benefits of semi-structured interviewing

Semi-structured interviews were used in this research as the second of two primary sources of data collection. During semi-structured interviews the research participants provide answers based on their perceptions, thoughts, understandings and/or experiences. The semi-structured interview allows for both the depth and flexibility of responses from respondents, while accommodating spontaneity in the composition or "standardization" of the question (Robson, 2011, p. 279). They are designed to probe a research topic with flexible wording and sequencing of questions. In semi-structured interviews the questions are open ended, with the

sequence of questioning modified depending on the situation of the interview (Robson, 2011). The most useful feature of this type of interview is the ability of the researcher to spontaneously add supplementary questions based on the respondents' answers.

Semi-structured interviews are often used to explore attitudes, values, beliefs and motives (Richardson, Dohrenwend & Klein, 1965; Smith, 1975). To uncover past or present feelings of participants regarding any issue, the semi-structured interview is essential (Weiss, 1994). Therefore, it can be said that to get rich and multi-dimensional data for sociological analysis, then the qualitative semi-structured interview is best (Mikene, Gaizauskaite &Valaviciene, 2013). However, apart from obtaining rich and multi-dimensional data, there are other significant advantages of interviewing.

Austin (1981) sees interviewing in general, and semi-structured interviews in particular, as a means of overcoming poor response rates. Here, a poor response rate refers to those participants who are not willing to respond or participate at the expected level in other methods of data collection such as questionnaires. In interviews, observing and interpreting non-verbal indicators can give researchers new perspectives in their thinking and analysis (Gordon, 1975). Bailey (1987) believes that the semi-structured interview ensures the full participation of each respondent without any assistance from others.

Interviews are also used by researchers who work with children and adults with disabilities. By using interview method many researchers collect valuable data from disabled children regarding their education, their use of information technology, and their use of assistive technology in educational institutions and their everyday lives (Draffan, Evans, & Blenkhorn, 2007). It is believed that life experiences of disabled students can generate transformational knowledge that reveal a new era (Kerschbaum & Price, 2017). It is the belief of this researcher that it can be the same with adult disabled students.

4.2.4.2 Interviewers' required competencies

The attitude and beliefs of the interviewer can affect the responses of the interviewee (Dockrell, 2004), and this is where the skills and awareness of the interviewer become relevant. In a nutshell, the quality of the interview depends on the understanding of the interviewer and the social context (Rapley & Antaki, 1996). Therefore, it is effective communication between the interviewer and interviewee which is the main guiding means of

gathering authentic and effective data. In this regard, developing and using an interview guide that tackles these issues can help to meet the challenges (Sigstad, 2013).

Sigstad (2013) states that the cognitive and linguistic limitations of the interviewee need to be taken seriously. Understanding the characteristics of the interviewee needs careful observation, and this is a challenge for researchers (Finlay & Lyons, 2002; Fujiur, 2012; Rapley & Antaki, 1996). Another frequently reported challenge of using this method of interviewing is the tendency of interviewees to acquiesce – meaning that they may have a disposition towards a positive reply to a question (Finlay & Lyons, 2002; Heal & Sigelman, 1995; Sigelman et al., 1981a, 1981b). Or they may tend to subconsciously give the answers they feel they are expected to provide. Bearing this in mind, the interviewer needs to be conscious of all these factors in both the design of the interview questions, and in their interview method. Here it is also important for the interviewer to be sensitive to the need to add additional questions if they feel it is required.

As with all research methods, interviewing has some limitations. It requires preliminary arrangements for obtaining permission, scheduling appointments, and planning alternatives for non-attendance of respondents (Robson, 2011). Apart from these, issues also arise regarding the length of sessions. Although the duration of any interview session is not fixed, Robson (2011) suggests that the duration of sessions should be between thirty and sixty minutes to be appropriate for data collection.

Interviewer bias is another issue which may impact objectivity in light of the interviewer's own particular beliefs, thoughts, pre-set ideas, and motives (Scheurich, 1995, cited in Fontana & Frey, 2005). This is an issue which the present study has remained mindful of, with the researcher often seeking critical advice from others.

In summary, semi-structured interviews were chosen for this current research for various reasons, but primarily because of the variation in the professional, educational and personal histories of the sample group. This strong variation precluded the use of standardized 'closed-ended' interviews and demanded more qualitative research. Semi-structured interviews were chosen also in order to explore respondents' opinions on a variety of matters, many of which were relevant only to them. Such an interviewing technique has the ability to complete all the information required, and is also able to explore and probe unique and sensitive topics in each interview (Barriball & While, 1994).

In this study, individual face-to-face semi-structured, conversational interviews were used to generate data from each participant regarding: their digital technology usage (what technologies they were using, for what purposes, and differences in usage depending on disabilities), factors influencing technology usage, and especially the students' perceptions of the possible impacts of these technologies on their academic experiences. Interviewing as a method is well appraised for its capability for understanding "people's perceptions, meanings, definitions of situations and constructions of reality" (Punch, 2014, p. 144). The semi-structured interview research method is therefore considered as a means of allowing the researcher to "'get inside the heads' of particular groups of people and to tell things from their 'point of view'" (Silverman, 2013, p. 201). Accordingly, this study deployed this interview method for encouraging disabled HE students to represent their experiences and perceptions regarding digital technology practices in their learning, as well as living, in the academic world.

4.2.5   Focus group discussions

Focus group discussions (FGDs) – the second of two primary sources of data collection in this research – are guided discussions which involve a small number of people (with similar characteristics) in informal group conversation on a specific topic ('focus') or series of issues. This type of discussion is usually assisted by visual or other stimuli (usually questions) as prompts. The researcher assumes the role of moderator, taking on the job of raising issues to be discussed, while the participants interact with each other (and the moderator) in expressing their thoughts, experiences and evaluations regarding the questions raised for discussion (Silverman, 2013). The data therefore arise from the interactions between participants rather than answers being given to an interviewer.

Focus group discussions should not be confused with group interviews, since focus groups aim to engage participants in a discussion on a 'focused issue of concern' in order to produce data and insights as an explicit outcome of group interaction (Liamputtong, 2011; Morgan 1997).

Kitzinger (1994) recognizes two types of interaction in focus groups: complementary and argumentative interactions. In the former, participants share their experiences, manifest their concerns and state their needs regarding the focus of the discussion. On the other hand, argumentative interactions involve disagreement with others' perceptions. This allows

researchers the opportunity to uncover the underlying reality of the participants' views expressed in the interaction. Logical argumentation can influence participants to review their opinions and examine the reason for diverse perspectives (Liamputtong, 2011). Kitzinger appropriately summarises argumentative interactions as interactions which "led them [the participants] to clarify why they thought as they did, often identifying aspects of their personal experience which had altered their opinions or specific occasions which had made them re-think their point of view" (Kitzinger, 1994, p. 113).

As described by Conradson (2005), focus groups are considered valuable from several perspectives. Firstly, they give the researcher an opportunity to explore a diverse range of participant views regarding particular topics, and they aid the researcher in understanding the participants' approaches to collaborating and arguing their viewpoints. FGDs are effective in providing insights into the "feelings, thoughts, understandings, perceptions and impressions of people in their own words" even if the researcher has insufficient depth of knowledge regarding the participants (Liamputtong, 2011, p. 6). Secondly, focus groups are valuable in providing opportunity for investigating why individuals and groups have a particular understanding of a topic, as well as comparing participants' understanding of that topic (Conradson, 2005).

The most significant advantage of focus groups is their ability to generate abundant information from a representative group in a short period of time (Kamberelis & Dimitriadis, 2005). Punch (2014) describes participants being able to manifest their views, perceptions, and reasoning through the stimulation of a group setting. This group interaction helps to follow up, 'cross-check' and even reveal data that would not be possible to access by any other method such as a questionnaire or individual interview (Liamputtong, 2011, p. 6). In addition, the thoughts and comments generated from interactive discussion can encourage participants to express their own ideas regardless of dilemmas, reluctance, and obstruction (Robinson, 1999).

Liamputtong (2011) sums up FGD research by describing it as a research tool which provides the participants with a voice by allowing them "to define what is relevant and important to understand his or her experience" (p. 11). Another aspect of FGDs which is most important in this research, is their ability to provide researchers, policy makers and others with insights into the issues of marginalized populations who cannot usually express their perspectives regarding their situation and experiences (Liamputtong, 2006, 2010; Madriz, 1998).

A further reason for the use of FGDs is to complement other interviews that were conducted. As the FGD participants had previously taken part in the individual interviews, participating also in the FGD would allow the possibility of examining differences between the comments made by individuals in both activities. As stated by Edmunds (1999, p. 8) "participants may respond differently regarding a specific issue than if they had been discussing the same topic, for example, during a telephone or one-on-one interview."

According to the design of this study, the focus group discussion was used as an ancillary form of data collection to be compared with the data generated through the interviews. The focus group questions were similar to the interview questions with the expectation that there could be some contrast between the data generated through the interviews and the FGD. The 6 participants of the FGD were from among the 10 students who took part in the individual interviews. The participants varied according to age, gender, disability type, and area of study.

The case study method is sometimes criticized for its 'scientific generalizations', and for the many documents of narratives gathered through investigations (Yin, 2009). Also, in some cases research direction can easily be influenced by the researcher's preferential views (Yin, 2009). Though it is an inevitable issue in interpretivist paradigms, in order to minimise this bias, this study used some safeguards to keep this influence to a minimum level. First, the research followed existing literatures which can benefit as 'shadow critics' to help eliminate the possible influence of individual views. Secondly, throughout this research the researcher had frequent discussions with a colleague (a 'critical friend' – an academic with experience in the field of study). This person "asks provocative questions, provides data to be examined through another lens, and offers critique of a person's work" (Costa & Kallick, 1993, p. 50) to minimize the potential impact of personal views.

A number of potentially problematic issues need to be considered, however, when conducting focus groups. One of these is that researchers need to remember to consider the impact of the group culture and dynamics, and respond to this in ensuring a balance of expression in the group. Fontana and Frey (2005) noted that in focus groups the moderator may face problems with participants who dominate discussion, possibly because of greater social skills or self-confidence, or because of better skills in articulating what they want to say. Conversely, less articulate and less confident participants might be reluctant to engage in the discussion. The moderator's role, therefore, is crucial in managing any group members' domination of the group, as well as in encouraging timid participants to contribute (Bloor et al., 2001).

FGDs are also sometimes criticized for generating data with less depth, and for their inability to provide detailed/explicit opinions of any participant due to time constraints (Morgan, 1997). Kreuger and Casey (2009) point out that when focus group sessions have a time limitation and a large number of participants or participants who dominate, then "superficial and trivial" responses may occur. Research also found that participants do not reveal personal experiences in group discussions as they usually would in individual interviews (Hollander, 2004, Pain & Townshend, 2002, in Hopkins, 2007). Diversity in participants is considered as a critical issue for enabling depth of information through FGDs (Bloor et al., 2001). Bloor et al argue that although diversity of participants is essential for discussion, sometimes it causes a lack of opportunity for exploring the topic in depth. Furthermore, Sim (1998) argues that FGD suffers from a limited ability to generalize its findings since participants are gathered by non-probability sampling and the data do not represent a large population.

4.3   Research methodology and contexts

Having discussed in detail the methodological approaches used in this research, the following sections describe and justify the detailed process of method choices, the data collection process and the analysis of data, all in relation to the contextual reality.

4.3.1   The national context of Bangladeshi higher education

Bangladesh is a developing country in Asia with a long historical and cultural tradition. The withdrawal of British Colonial government from what was then the Indian sub-continent in 1947 created a partition with the two independent countries of India and Pakistan forming on the basis of religion. Bangladesh (then East Pakistan) became a province of Pakistan.

As a result of disputes regarding cultural differences and the socio-economic oppression of the West Pakistani rulers, the people of this land gained independence from the West in 1971 after what became known as the War of Liberation. As a newly formed war-torn country, Bangladesh faced numerous difficulties in rebuilding its economy, infrastructure and welfare services. The country started with a democratic government soon after independence, but after the assassination of Sheikh Mujibur Rahman, the father of the nation and President, in 1975 in a military coup, the country experienced a long marshal law regime until1990. As a result of mass opposition, the military-backed ruler stepped down and handed over the power to a civil government. Since then, the country has practised parliamentary democracy.

The country has developed a dense population of 160 million in a land mass of 147,570 square kilometres (Bangladesh Bureau of Statistics, 2012). The majority of the population are ethnically *Bengali* (98%) with very few remaining indigenous people. The country has people of all major religions with the most prominent being Islam, but ensures complete freedom to practise any religion. Although migration to metropolitan areas is a significant trend, most people still live in rural areas. The growth in industry, especially the ready-made garment (RMG) industry, is noteworthy. The country earns most of its foreign currency through this industry. Both government and non-government organizations (NGOs) have initiated income generation opportunities for citizens through creating jobs and promoting entrepreneurship. Despite these efforts, the country has a substantial poverty rate.

Within this broad socio-economic context, higher education is the third major stage of the Bangladeshi education system (preceded by five years of primary education and seven years of secondary education). Higher education comprises two categories of institutions: degree-awarding universities and colleges affiliated with the National University (NU). After finishing the higher secondary sub-stage, students are required to pass the Higher Secondary Certificate (HSC) examination. After successfully passing this examination they can gain admission into universities or enrol in NU colleges to pursue a first degree. There are several streams of higher education in Bangladesh including: general education in pure and applied sciences, arts, business and social science, *madrasha education* which has subjects and curricula related to Islamic thoughts and practices, and *technology education* consisting of agriculture, engineering, medical, and information technology.

In the general stream, 'HSC pass' students are permitted to enrol in three-year degree Pass Courses in colleges affiliated with NU. After completing this pass degree they may enrol for a two-year master's degree. From the NU colleges students can also obtain a four-year Honours degree. For the students enrolled in a Bachelor of Honours degree in any college or university, the duration of these courses is four years with an additional year for a masters.

In 1971, Bangladesh had four general and two specialized universities in the whole country. 50 years later there are 45 public and 103 private universities in Bangladesh (University Grants Commission of Bangladesh, 2019). Public universities are funded by the government through a yearly grant by the University Grants Commission (UGC). Private universities, however, are a relatively new phenomenon.

The first of the many private universities was founded in 1992 on a 'for profit' basis. These universities are expanding in terms of students' enrolment, courses offered and job-orientation. They are also administered by the UGC regulations but receive no government grants. Although it is evident that the country has been increasing its student population since independence, the total proportion of higher education students remains low.

The Bangladeshi education system is governed by two ministries. Primary education and 'mass education' (for general literacy and lifelong education) come under the governance of the Ministry of Primary and Mass Education (MoPME) and the post-primary level is controlled by Ministry of Education (MoE). Both ministries have directorates, national departments and peripheral organizations. The Bangladeshi education system has succeeded the British colonial education, with a significant legacy of reform enacted during the British and Pakistani rule. The basic pattern of the national education system remains rooted in this legacy, as stated by Rahman et al. (2010) below:

> It [Bangladeshi education] is characterised by [the] co-existence of three separate streams running parallel to each other. The mainstream happens to be a vernacular based secular education system carried over from the colonial past. There also exists a separate religious system of education. Finally, based on [the] use of English as the medium of instruction, another stream of education, modelled after the British education system, using the same curriculum, has rapidly grown in the metropolitan cities of Bangladesh (p. 115).

The Bangladeshi education system is still developing, of course, but it has far to go. Traditional paper and pencil testing is still practised for assessing students' achievement from the primary to the highest level of education. Teaching is seen only as a means of inserting knowledge into the learners' brain rather than also to facilitate understanding. Most of the institutes focus almost entirely on placing graduates into jobs – just like the British attempts of giving education to the colonial lands just so they could serve their rulers, and without any regard for the enlightenment and progressiveness of the students. However, the country is transforming gradually to what is considered a modernized education system by introducing aspects of education such as e-governance, ICT facilities and a clear emphasis on supporting the students to become more pragmatic. Still, however, an emphasis on student understanding, research and exploration is lacking.

The first education commission was formed in 1972 after Bangladesh became an independent country. This commission presented their report in 1974 with recommendations, with the aim

being to create a modern, scientific and global generation of Bangladeshis within the nationwide educational mechanism. This commission proposed to extend primary education from grade five to grade eight. Later commissions also proposed the same, but this reform was not even initiated by ruling governments until the 'National Education Policy 2010' was enacted. This policy replicated the first education commission's recommendation of extending primary education to class eight, but it would do so gradually.

The current education system of Bangladesh is directed by this national policy (2010) and as per this policy recommendation the MoE has recently formulated its first ever 'Education Act' (2013). The entire education system of the country is now operating under the guidelines of both the National Education Policy 2010 and the National Education Act 2013. The country is also carrying out a five-year plan to accelerate the development of the education sector.

With regard to higher education, the UGC formulated a National Strategic Plan for Higher Education (NSPHE) 2006-2026 to be funded by the World Bank. This Strategic Plan identified major challenges in this sector as well as the promotion of strategies to enhance policy and interventions. In particular, the NSPHE identified the funding of higher education and the sustainability of investment as the greatest challenge (University Grants Commission of Bangladesh, 2006). The plan highlighted the long-debated issue of the subsidized nature of HE in the country with the aim of finding alternatives for this subsidy-prone system. The NSPHE pointed out strategic issues which it proposed to resolve sooner, specifically the extent of government funding, per student expenditure and fee revision, HEIs quality assurance, the opportunity of equal accessibility, and the universities' research scope enhancement, etc. One significant contribution of this report was the proposal of a timeframe of twenty years by which the country should achieve some advancement in terms of both quantity (e.g., gaining 20% enrolment in HE in contrast to the current percentage of 4.04) and quality. As quality was one of the core challenges for HEIs, the report appropriately emphasized the necessity of continuous refinement of curriculum, modernization of education, provision of administrative resources and progression in teaching learning processes (University Grants Commission of Bangladesh, 2006).

The MoE is responsible for governing the higher education sector. The ministry oversees the universities through the administrative branch of the University Grants Commission (UGC). The major responsibilities of the UGC are to co-ordinate the activities of the universities and allocate the government grants to the public universities. It also approves the foundation of

new universities, the operation of departments and degree awarding, as well as monitoring the quality of teaching and learning in private universities. Nevertheless, universities enjoy the freedom of being able to create their own curriculum and syllabus, recruit teachers, conduct examination and publish results. Tertiary colleges are maintained by the National University (NU) in terms of academic management, administering examinations and awarding degrees. Unlike the universities, the teachers of colleges under the NU are selected from nationwide competitive public service examinations organized by the Ministry of Public Administration (MOPA). After this, the MoE has the responsibility for the posting, transferring and promotion of the college teachers.

The government has taken numerous initiatives to mainstream the benefits of new technologies in human development sectors, particularly in education. One of these initiatives is the government's Digital Bangladesh by 2021which was declared to be an integral part of the ruling party's election manifesto made in December 2008. The party interpreted this agenda as a long-term vision for the country's holistic emancipation from economic, cultural, and social backwardness. The potential of information and communications technology (ICT) has been recognized as the overarching enabler for bringing in national prosperity. After forming government in January 2009, assumingly influenced by the promises made in their election manifesto 'Charter for Change', the government initiated the implementation of their vision for digitalization with significant priority. It seemed apparent to the government that the preparedness of its people to use ICT as a tool for development is a precondition for propelling their Digital Bangladesh agenda to its intended goal. For this, both ministries for education (the MoE and the MoPME) commenced to:

> … develop digital materials for school education. Realizing the inadequacies of the digital platforms in schools, especially the absence of them in primary schools, the ministries have started with digital materials for teacher education which is a crucial area of building the capacity of teachers who are going to build the soldiers for Digital Bangladesh. Innovations like use of TV and Video in classrooms are being tested in several instances. The radio based adult education programme has already shown great prospects (Government of People's Republic of Bangladesh, 2009, p. 6).

As a continuum, the Planning Commission of the Government of People's Republic of Bangladesh (GoB) formulated its Outline *Perspective Plan of Bangladesh (2010-2021): Making Vision 2021 Reality* in June 2010. It was intended that this plan would work toward building "a resilient, productive, innovative, and prosperous nation with a caring society

consisting of healthy, happy, and well-educated people" (Government of People's Republic of Bangladesh, 2010, p. 4). Among its key aims, this plan aimed to achieve a literacy rate in the education sector of 100% soon after 2014. It also firmly recognized that education is pivotal to achieving an information explosion along the way to creating an actual 'Digital Bangladesh' (Government of People's Republic of Bangladesh, 2010). The plan proposed computer aided learning, technology enhanced teaching and learning processes, teacher development programs and skills improvization at all levels of education (Government of People's Republic of Bangladesh, 2010). Particularly in higher education, some factors recognized as mitigating against the quality of education include inadequate academic supervision, improper preparedness and accountability of the teachers, scarcity of textbooks and limitation of resources.

The National ICT Policy (2009) is also an important factor for fostering the envisioned Digital Bangladesh by 2021, and is based on the government's realization of the enormous impact of ICT in all spheres of national development, in human development, creating effective communication, and resource utilization (Government of People's Republic of Bangladesh, 2009). This National ICT Policy (2009) has 10 objectives, 56 strategic themes, and 306 action items. The strategic themes are set in accordance with the objectives and for implementing the action items, with short, medium and long-term actions being specified. In the specific objective regarding education and research, the policy paper proposes using ICT for spreading the scope and quality of education and ensuring computer literacy in all spheres of education and government services (Government of People's Republic of Bangladesh, 2009). Particularly for higher education, the policy set out strategies by which universities of the country would supply competitive ICT education and introduce higher degrees in ICT education in order to inspire research and invention (Government of People's Republic of Bangladesh, 2009).

4.3.2 The research setting

One of the major higher education institutions, and the focus for the empirical element of this thesis, is the University of Dhaka. It was the first to be established in the country. The ruling British government founded this university in 1921 for the people of the then 'East Bengal'. Dhaka (then called Dacca) became the capital of East Bengal after the historical Bengal Partition in 1905. The partition was annulled in 1911 after a long political dispute. It is said the university was established as compensation for that annulment of the Bengal partition.

Starting with three faculties, 12 departments, 60 teachers, 877 students and three dormitories the university expanded to 13 faculties, 12 institutes, 83 departments, almost 2000 teachers, 20 halls of residence and an increase of student numbers to around 38,000 (University of Dhaka, 2021). Since its year of inception, this university has been considered as a pioneer in higher education, research and scholarship. Currently six semi-annual English journals and one ten-monthly Bengali journal are published by six different faculties routinely. Some other ten departments produce their sole journals in their respective disciplines.

This university was chosen because it is counted as one of the largest HEIs in Bangladesh, both in terms of students' number, as well as in terms of disabled student population (University Grants Commission of Bangladesh, 2019; Hossain, 2012). The university has a number of established resources for disabled students. These include a full-time 'disability officer' who is responsible for managing issues related to disabled students in the university. The university also has an academic department named 'Department of Special Education' in the Institute of Education and Research (IER). This department offers a four-year Bachelor of Education (Honours) and a one-year Master of Education. Both these degrees integrate disabled students with the non-disabled students. As well as this institute, some other faculties also enrol disabled students mostly through a system of 'disability reservation'.

In addition, there is a 'Visual Impairment Resource Centre' at the central library. This resource centre has assistive technology facilities and internet services for visually impaired students, with significant numbers of reading materials (mainly textbooks) transcribed in Braille and/or transcribed into audio media. Within this context the study was able to access appropriate research participation and institutional support.

4.3.3   The research methods: Case studies, interviews and focus discussion

The methods for data collection for the Case Study research of this thesis consisted of:

- Initial interviews of 10 students with disabilities in HE in Bangladesh.

- A Focus Group Discussion with six of these students.

- Follow-up interviews of the same disabled students 16 months later in Bangladesh.

As well as gathering data for the ten case studies, at the time of the follow-up interviews, eight others were also interviewed as key informants (not case study participants). These

were two senior students, two philanthropic organization staff members, three university staff members and one teacher at the university.

4.3.4 Purposive sampling and the selection of participants

Ten case study participants were recruited through purposive sampling from the disabled student population at the University of Dhaka in Bangladesh. The composition of the group was carefully considered, with participants purposefully recruited from similar faculties to avoid significant differences in learning patterns.

In qualitative research, sampling is the process of selecting willing and consensual participants for specific research from a designated population (Trochim, 2005). In this definition, 'population' refers to those individuals having similar characteristics relevant to the research topic (Creswell, 2012). Appropriate methods for sampling are important for choosing a convenient number of participants to represent a large group (Cherry, 2018).

Research scholars such as Creswell (2012), Stephanie (2015) and Barreiro (2018) have classified sampling methods into two basic types: probability sampling and non-probability sampling. Probability sampling refers to a sampling process where each member of a population has equal probability of selection (Stephanie, 2015). Stephanie (2015) and Creswell (2012) also call this random sampling.

Closely related to probability sampling are other forms of sampling, including systematic random sampling, where a sample is chosen from a specific sequence frame from a well-known and organized population. Another method is stratified sampling, where the sample is chosen from pre-divided homogeneous groups. If the selection occurs from heterogeneous groups then it is called cluster sampling. Another form of sampling – multi-stage sampling – is a combination of various techniques.

Apart from probability sampling, researchers also use non-probability sampling where samples are chosen by non-randomized methods (Doherty, 1994). Creswell (2012) mentions convenient and snowball sampling. In convenient sampling, researchers select someone who is easily accessible and who fits certain other criteria. In contrast, the snowball sampling technique is applied when samples are difficult to locate. Fink (2003) and Doherty (1994) mention quota sampling and purposive sampling. Quota sampling involves compulsory selection of a sample from a pre-defined group. Contrary to this, in purposive sampling researchers select samples where the participants have characteristics relevant to the purpose

of the research. Purposeful sampling is used mainly in exploratory research. It is more convenient, cost-effective, and readily accessible. However, there can be uncertainty as to whether the sample truly represents the target population (Showkat & Parveen, 2017). Therefore, the researcher's ability is an important factor in this technique.

Purposive sampling is typically used in studies where the researcher intends to recruit participants with varied characteristics in order to obtain diverse results (Bryman, 2012). One prominent approach of purposive sampling is 'maximum variation sampling' which aims to "ensure as wide a variation as possible in terms of the dimension of interest" (Bryman, 2012, p. 49). This present study aimed to explore varied experiences from disabled students with different demographic characteristics in order to get maximum diversified data to determine if there were patterns or themes which emerged across a population.

The aim was to obtain data from all the years (first year to final year, even Masters) students as their perceptions might be different depending on their maturity in the university. The intention was also to include students with different disabilities, bearing in mind that the technology experience of a visually impaired student would be quite different than the experience of students with physical disabilities or hearing impairments. Also, it was hoped that diverse data from male and female students might indicate gender differences in regard to their university experiences. This is what was meant by 'diversified data' in this study.

All students registered as disabled within the university were contacted by the disability officer of the University of Dhaka to request their consent to participate in this study. Thus, the need for research participants was publicized by the disability officer, but also by peers/classmates of students with disabilities in the university. (Some of those contacted suggested friends who might want to participate, who were also then contacted.) After then determining their initial interest, I made contact by phone and explained the research. After this call, most of those initially contacted were keen to participate. Most of the students whom the researcher called showed their interest to participate, and from these a group of ten were chosen.

At this early stage the researcher already began to get to know the students, and what motivated them. As the researcher spoke to each over the phone, he found that they generally had a feeling of being neglected by the university. They stated that their thoughts and needs were seen as unimportant (this is explained in more detail in the findings chapters). When the researcher invited them to participate, he explained to them that they might want to see this as

an opportunity to express their unspoken and unasked thoughts and their university experience. From this early stage the potential participants had the opportunity to decide if they wanted to participate. In this way, they selected themselves as volunteers for this research.

Next, these research participants were sent an Explanatory Statement, a consent form, and the details of the host university's relevant policies. Following this, interview times were scheduled (again by phone and then email) for each participant. This was all done prior to the researcher travelling to Bangladesh in 2016 for the first phase of data collection.

Ten disabled students were selected purposefully on the basis of their various representing characteristics such as gender, age, the academic year and subject of study, disability type, and the nature of technology use. Ten cases were chosen according to the researcher's own judgements in regard to selecting a variety of persons who were willing to be involved, and who indicated their use of technology.

Table 2

Selected Research Participants and Their Characteristics

Sl	Pseudonym of cases	Gender	Age	Academic year	Disability type	Subject
1	Ahmed	Male	21	First	Vision	Education
2	Iftikar	Male	27	Masters	Vision	History
3	Shahdat	Male	22	Third	Vision	International Relations
4	Humayun	Male	20	Third	Vision	Education
5	Nazat	Female	20	Second	Vision	International Relations
6	Tamanna	Female	21	Second	Vision	Education
7	Selim	Male	20	Second	Physical	Psychology
8	Utpal	Male	23	Fourth	Physical	Management
9	Sagir	Male	23	Third	Physical	Management Information System
10	Sujata	Female	20	First	Speech	Banking and Insurance

This table indicates the varying basic characteristics of the research participants. In doing so it illustrates the lack of sameness among the students, in that they varied significantly from each other. Perhaps the most significant aspect of this table is the large proportion of the students who are visually impaired.

4.3.5   Participant profiles

The participants in this case study research were mostly from the same pre-existing social group. Due to the small population of such students in the university and because of their membership in the Disabled Students Association, most of the students already knew each other. The age of participants ranged from 20 to 27 years. Further details on the cases are presented in Appendix VI.

4.3.6   Research instruments and materials

The primary research materials used were detailed lists of questions for the interviews and focus group discussions. During the interviews, first I asked basic information questions (name, age, gender etc), and then informal questions designed to help them to feel at ease. This was followed by questions about digital technology use, the available provision of technology, their perception of the impact of technology on them, and any support needs they had. Different yet similar questions were asked in the Focus Group Discussions. Full details of these questions can be found in Appendix VIII.

4.3.7   Data collection procedures

4.3.7.1 The first round of interviews

Each participant was interviewed twice during the data collection procedure. The first interview session took place at the beginning of data collection where initial responses of the participants regarding the research questions were explored. The interviews ranged from 60-90 minutes and were audio recorded with the prior consent of the participants.

The interviews took place on campus. The student participants preferred to be interviewed at the University, and all of these took place in the researcher's office throughout April 2016, either in the morning or afternoon, according to the students' preferences. All of the participants came alone to the interview except one female student with visual impairment. Her mother came with her as she always accompanied her daughter whenever she left the

house. During the interviews, initially some of the participants were uncomfortable. I felt this was because they were speaking with a person with whom they were not at all familiar. However, they were made to feel at ease through 'ice breaker' questions about topics such as their university life, hobbies, family and friends. After observing that the discomfort of the participants had been minimized, the researcher then asked the primary interview questions.

4.3.7.2 The focus group discussion (FGD)

The FGD occurred in the first week of April 2016. Six participants who had been interviewed previously participated. The venue was at the University of Dhaka, as most of the participants lived inside the campus and it was convenient for them. The place chosen for the interview was my office. The session was almost 2 and half hours long with a 15 minutes interval. Initially it was going to be only 90 minutes, but considering the participants' interest the FGD was extended by approximately one hour.

The focus group was moderated with the help of an assistant. The assistant organized the audio recording of the whole session, assisted the participants if they needed any support such as assistance (particularly for those with visual impairments) to make their way from downstairs up to my office, for example, and organized the lunch which took place immediately after the session.

Before the session began it was explained to the participants that its purpose was to explore the digital technology experience of disabled students of the university. This would be done by sharing each other's experiences and reflections regarding the use of digital technology. In order to 'break the ice' as well as to confirm the quality of the audio record, the moderator asked each participant to introduce themselves by stating their name and their department. After this the recording was checked to ensure the playback was in order as Bloor et al., (2001) suggested. They also stated that this initial experiment with the audio recording was helpful in later identifying the voices of each participant.

The participants were very enthusiastic and seemed to enjoy sharing their good and bad experiences in the university. They spoke freely and even fell into disagreeing and debating with each other. This session provided an opportunity to validate the earlier interview data. It also provided – through open discussion – new insights. In FGD the participants opened up more than they did in the interviews. This could have been for a number of reasons. However, it was perceived that they felt more at ease in the company of other students,

particularly students of a similar age, and students who shared similar feelings about their disappointments and 'exclusion' from the university. It was exciting observing these students' 'ups and downs' through the course of the discussion, their agreements and disagreements, their conflicting perceptions, and their experience of digital technology at the university. Later, after the conclusion of the Focus Group Discussion, the audio recording was transcribed verbatim.

4.3.7.3 The second round of interviews

The second round of interviews occurred with the same students almost a year after the initial interviews, with one exception – Nazat, a visually impaired participant of the first round, could not participate. The interviews took place on the university campus at my office or in their residential halls, at the canteen or another open and quiet space. Depending on their availability, some were interviewed in the morning and some in the afternoon. All these interviews were carried out on a different day between in early August in 2017.

These second interviews were really 'follow-up' sessions for additional data and clarifications. This session also sought answers to new questions (based on my reflections after the first round of interviews). These interviews – more than a year after the first interviews – were beneficial because of the clarification they provided, and because the participants had further technology experiences and perceptions to share.

During the second interview phase, as well as the nine students who had been interviewed 16 months earlier, some other students were also interviewed. These other 'senior students' were very advanced in their studies. Some had been mentors to the original ten students in that they participated in helping them to cope with their lives on campus. This included helping them deal with study commitments and helping them with daily life and study related issues.

These senior students will be discussed in the first findings chapter where they are mentioned loosely as 'mentors' of new students who are unfamiliar with the university. During the interviews all of the student participants emphasized the senior students' influence on their motivation to start using technology, as well as the benefits to them of the mentoring role they undertook in regard to their technology related queries. The researcher interviewed two such senior students in the second round of data collection and explored their perceptions regarding the university support services. Both of them were students with disabilities who had their own experience regarding the university's last few years of technology initiatives.

Therefore, it was expected that they could reflect on university provisions from a different perspective.

4.3.7.4 Additional interviews with institutional representatives

Additional to the case study participants' (students with disabilities) experience of the university provision regarding technology, during the second phase of interviewing the researcher generated data from interviews with the Disability Officer of the university, two Assistant Librarians (all of these three staff members were person with visual impairment), and a faculty member. These staff provided information regarding university provisions for the students with disabilities. The faculty member (a teacher) who was interviewed taught ICT courses in one of the institutes and he was happy to provide his experience of working with students with disabilities in his class. He also provided his perceptions regarding the barriers the students with disabilities faced, and the impact that technology had on these students with disabilities.

It had been evident from the first round of interviews with the students that some philanthropic organizations had been working to provide various support services for them in the university. These organizations voluntarily facilitated the students' living and study on the campus. The presence on campus of these organizations had mostly been initiated by the student body of this university.

It was significant that students without disabilities were involved with such voluntary organizations. Moreover, there were also some registered non-governmental organizations (NGOs) working at the university to support students with disabilities. The officials of two such two philanthropic organizations were interviewed. Both had been working with students with disabilities within the university. The purpose of these interviews was to explore their support services regarding technology, the purpose of those supports, their network with the students, their perceived impact of their support of students with disabilities, and problems they experienced while implementing their support activities. In short, this research followed the data collection procedure set out below in Figure 3:
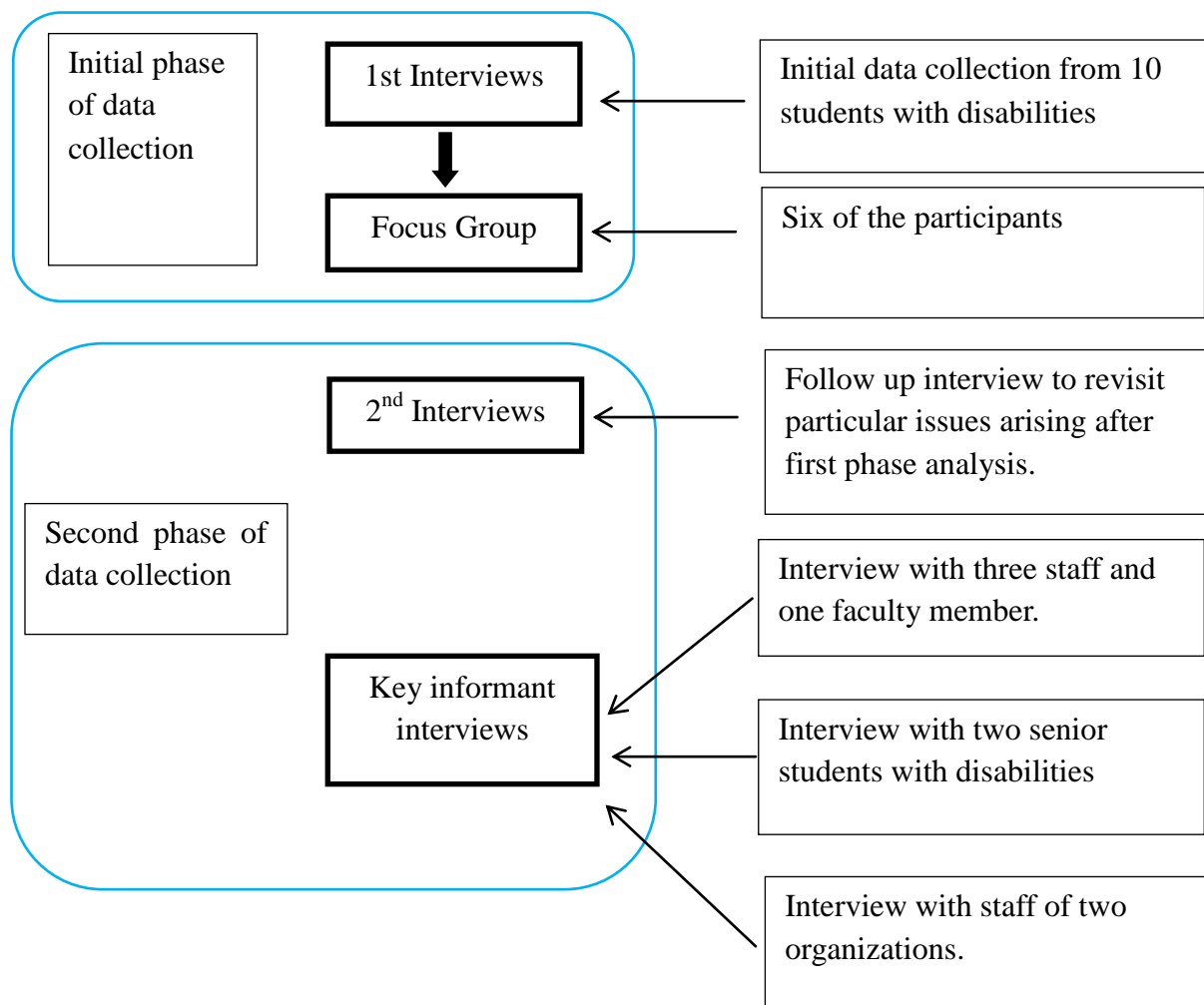
Figure 3. Data collection for this project

4.3.8 Access and ethical considerations

As Munford, Sanders, Veitch, and Conder (2008) reflect in their study, a 'research relationship' with the participants as well as the supporting organization is an important consideration in gaining access to the participants, for recruiting them and eliciting a flow of information about the participants from the organization; particularly in research where access to participants is subject to approval from "tiers of management" (Lennox et al., 2005, p. 301).

Access to the disabled students was obtained through a formal application of the researcher to the appropriate authority – which was the Vice Chancellor's Office. With the application, information explaining the intentions of the research was attached, as suggested by Nind

(2008), among others. After obtaining permission for the research, the researcher contacted the Disability Officer as well as the faculties where most disabled students were studying.

This is clearly a study that encountered ethical issues associated with researching a vulnerable population. The researcher was aware of the need to address the sensitivity required for working with disabled students. First of all, anonymity of the self-selecting participants was ensured in this study. To maintain this, the study used pseudonyms of the participants in reporting the results of the research. Furthermore, the researcher was concerned about disabled students (particularly those who were with vision impairment) being exposed to an unknown person for the very first time. In regard to this consideration, each participant was asked how they wanted to be contacted for the research. If someone would not commit to a face-to-face interview or a focus group discussion, they would not be allowed to be involved in the research. However, such a situation did not arise during either of the data collection phases.

A Participation Consent Form was delivered to each participant either via the Disability Officer, or in several cases via email, prior to the data collection sessions informing them about the research purpose, nature and activity, and informing them that they would be required to acknowledge (by completing a consent form on the day of the interview) that it was solely their decision to participate. They had been assured that this consent form would not prevent them from discontinuing their participation at any stage. Before the interviews and the focus group discussion, the participants were informed that all the conversations/discussions would-be audio recorded since these were evidence of authenticity of the research, but the recordings would be kept totally confidential (locked away at Monash University in Melbourne and accessible only by the researcher). They were assured that the content would not be disclosed to anyone, and their contributions would be revealed in this current research only under an assumed name. It was also mentioned that the data would be used only for the current research, and not for any other purpose.

As well as this, after they were interviewed, each participant was supplied with a transcribed version of their own first interview so that they could change or omit their statements. (This was not done at the time of the subsequent interview as the students mostly did not reply to the receipt of their transcripts at the time of the first interview). None of the participants' data has been used in this study without their final consent which was given in writing on the day of their first interview. They were each given many months to edit/omit parts of their interview transcriptions, yet no participant requested any change to their interview transcript.

However, the researcher recognized the possibility of a 'power struggle' with some of the participants. As a faculty member at the university, teaching in the Education Institute, and because my experience as a teacher embodied the gap between teachers and students, I felt that the students might not feel able to speak freely and openly with me. (cultural issues would also augment this gap and sense of a power difference). The researcher suspected (in accordance with Griffin & Balandin, 2004) that the voluntary participation and consent may turn into a coercive obligation/participation if a sense persisted of there being an 'unequal and dependent relationship' between the researcher and the participants.

To avoid this, the researcher informed the participants that he was on study leave for the duration of the research and told them they should consider him as a researcher rather than as a teacher of the university. In this kind of situation, the University of Sheffield's Ethics Policy firmly suggested the building of a 'trust relationship' between the disabled participants and the university researcher (University of Sheffield, n.d). The intention was to create that kind of trust relationship by establishing good rapport and friendly communication with the participants from the very beginning of the data collection process.

4.3.9 Issues of dependability and trustworthiness

Trustworthiness in a research study refers to honesty in data collection, interpretation and methods selected to ensure the quality of a study (Polit & Beck, 2014). In qualitative research, it is necessary to follow guidelines, standards and ethical consideration in collecting and presenting data for a wide readership. As detailed by Lincoln and Guba (1985), aspects of trustworthiness acknowledged by many qualitative researchers include credibility, dependability, confirmability, transferability and authenticity. Each of these is explained below. However, it should be noted that the relevance of these varies from study to study.

4.3.9.1 Credibility

Credibility refers to an ethical approach to research. In this study it means a vigorous scientific approach and attention to the methodology in all its detail. A major part of this is data collection which probes and records the lived experiences of the participants in a manner free of bias, and shaped to elicit rich detail. As Leininger (1994, p. 105) refers to credibility as "the truth as known, experienced, or deeply felt by the people being studied (emic or local)

and interpreted from the findings with co-participant evidence as the 'real world', or the truth in reality".

Credibility also requires a diversity of data. In this research this is achieved qualitatively, not in numbers of participants, but in the depth of the data gathered from each of a relatively small number of participants. As suggested by Polit and Beck (2014), relevant data such as close observation of participants, peer-debriefing, member-checking and examining participant journals are some of the techniques used for establishing credibility in this research.

4.3.9.2 Dependability

Dependability refers to the stability of data regardless of time, person and condition (Polit & Beck, 2014). Dependability is related to credibility, and usually follows it (Robson, 1993). In this research dependability has much to do with accuracy in all aspects of data collection and analysis, thus it involved careful examination of thesis drafts and all documents used. One example of dependability in this research is found in the translation of the data. To ensure accuracy of qualitative data interpretation, the related parts of interview and FGD transcripts were 'back-translated' where necessary and compared to the original in order to check accuracy (see Brislin, 1970; Sperber, 2004).

4.3.9.3 Conformability

Conformability refers to consistency and objectivity of findings (Polit & Beck, 2014). It is affirmation that, "the findings, conclusions, and recommendations are supported by … the data and that there is concordance between the research's interpretations and the actual evidence" (Hoskins & Mariano, 2004, p. 68). It is also research undertaken so that "…the conclusions and interpretations arise directly from" the data (Daymon & Holloway, 2002, p. 270).

In order to confirm consistency and objectivity of data, the researcher undertook two phases of data collection over the same sample group with an interval of more than one year. The interval was long enough to check if they would come up with same answer/response/information they had provided previously. The second phase of interviews also allowed probing for additional clarity and filling the gaps from round one. In addition, the researcher also interviewed relevant people (graduates as the participants often referred to

the seniors as the sources of guidance, etc.). The researcher also interviewed the Disability Officer and two officers from the Disability Resources Centre to verify data regarding the system issues that were reported by the students (for example the case of an unused Braille printer). In this way, the researcher verified the data set, in some cases, taking a case-by-case approach.

A similar process was also followed during data analysis and at the reporting stage to maintain a higher level of consistency and objectivity, and therefore achieve the conformability of this study.

4.3.9.4 Transferability

Transferability refers to how findings can be generalized from samples to the whole group. It is about general similarities of findings under similar environmental conditions, contexts, or circumstances (Leininger, 1994). In other words, transferability is about conducting research in such a way – with thorough records of all aspects of the research – so that the research can be repeated in another context or setting. Thus, researchers are able to duplicate and even extend their research in a comparable situation, and examine if further research in a different environment supports their findings (Krefting, 1991).

This study was done very methodologically following the scientific process of investigations. All methodological facts and processes are well documented in this report and further detailed records can also be available for any future researcher (depending on the consent of the participants). In addition, the methods, the participants, the data all were verified and rigorously investigated towards achieving the maximum possible accuracy.

4.3.9.5 Authenticity

Authenticity, the fifth and final element of trustworthiness in research, refers to getting appropriate information from appropriate people and resources. This research's aim is to explore the technology uses experienced by students with disability and, methodologically, they are the right persons to portrait their lives and experiences as students and IT users. However, though many of the data (claims, facts and information) have been methodologically verified, the informants remain they themselves. In addition, to ensure inclusion, cases have been selected from different disciplines and different socio-economic

backgrounds. The information collection was also very methodologically rigorous and in-depth to capture the bigger picture along with the details.

4.4 Analysis of data

The research questions this study focused on required in-depth presentation of contextual data and end user experiences which made the qualitative analysis most suitable for this research work. Moreover, to achieve systematic representation of data and clear analysis, this research adopted thematic analysis. Though thematic analysis is a poorly demarcated and rarely acknowledged, yet widely used qualitative analytic method (Boyatzis, 1998; Roulston, 2001 in Braun & Clarke, 2006), this study adopted thematic analysis for data analysis. This study, along with utilizing the methodological flexibilities, followed a systematic process in data analysis, which worked towards synthesizing results to answer the research questions.

As Bangla is the mother-tongue of both the researcher and the sample group, the data from interviews and the focus group discussion was generated in the Bengali language. As the interviews were recorded, detailed transcripts have been produced for all the collected data. During the primary processing, the researcher colour coded the data to identify the themes (please Appendix VII for a sample transcript). This process was followed for both stages of data collection and the second data collection was done 16 months after the first data collection. The second data collection was inspired by the data found in the first phase, as additional data collection seemed to be required for data verification and triangulation. For example, in the first collected data, the respondents spoke highly about the support from the senior peers and talked about non-functioning institutional supports about which, later on, in the second phase of data collection, the researcher interviewed additional relevant people to check and verify those claims and to dig deep into those perspectives. Also, the second phase of data collection strengthened the data validity as the same respondents were also interviewed using a similar set of questions after a year. This was done in consultation with the advisor of the research (thesis supervisor) and the initial plans of translating the transcript and then back-translation to Bangla again to maintain the consistency of the expressions were abandoned. The initial plan was to transcribe the complete data sets (all interviews and FGD recordings) in Bangla (source language) and then for an expert translator to translate that source-language version into English (the target version); and finally, it was to be back translated by another translator into Bangla. Then both the original source-language version and the back-translated version planned to be compared (as suggested by Sperber, 2004).

However, that process has been changed considering the enormous data volume given the interviews was done twice for additional data validation. In addition, instead of back-translating the whole data set, the complete data sets were transcribed and then relevant transcriptions were translated into English. The translated pieces were then compared and evaluated and, therefore, the accuracy of the data has been ensured.

'Thematic analysis' was used to identify common themes and to sort and report data in ways that permitted the researcher to give voice to the participants' thoughts and feelings as well as their accounts of their contexts, as supported by various researchers around the world (e.g., Boyatzis, 1998; Braun & Clark, 2006). Besides, the context of this research is quite unique as many of the challenges and enablers are unique to Bangladesh and to the socioeconomic group in the context of HE in the country. This pushed the researcher to go for thematic analysis with significant insertion of quotes and cases in the analysis chapters.

As Braun and Clarke (2006, p. 82) argued, "researcher judgement is necessary to determine what a theme is", so the researcher ploughed through transcripts and colour coded the high-frequency and significant phrases for potential themes. The raw thematic points were then grouped in accordance with the research questions and with their relevancy to be grouped to form the final themes and sub-themes. Then the descriptive data were presented in themes. In other words, the data from all interviews and the sole FGD were analysed using thematic analysis, which is "… a way of describing what things mean to people" (Gomm, 2004, p. 185). To do this, the raw data were segmented into manageable component parts, and then categorized into appropriate themes and subthemes. Finally, links between the emerging themes and relevant literature were established in order to portray the findings.

In order to present the data analysis and interpretation, the researcher then grouped the data in accordance with the research questions. In order to depict the complete scenario, altogether five analysis chapters were planned and prepared. In the first four data analysis chapters, each chapter addressed one of the four research questions. In the final chapter, the crosscutting themes that had emerged and which were connected with the theoretical framework were identified leading towards discussion and preparing the ground for recommendations.

Though the researcher's own choices influenced the emergence of those themes, they also connected the various literatures with the findings in very significant ways. In many cases there are data evidences which were not very prominent in the findings as they were less frequent than others, but in the context of this study and the researcher's own experience with

the subject matter in this context the greater significance of those themes was identified and they were included in this thesis.

As the interpretations were made, they were organized in four different data analysis chapters following the four research questions to provide a systematic but in-depth interpretation. At the end of each of these chapters, a brief 'discussion' has been noted as highlights of that chapter which, later connect and converge into the final discussion. The cross interpretation of findings, as portrayed in the six evolved themes, is followed by the final discussion.

4.5   Methodological limitations

Methodologically, the lens of this research could be narrower, which would bring methodological concentration and could produce stronger data validity. However, that would reduce the scope of this research and obscure the contextual horizons, without which the data interpretation would not have been as meaningful.

Since thematic analysis is a flexible data analysis method, it posed challenges in terms of the quality and objectivity of this research work. Because of the flexibility of this data analysis method, the researcher had to very strict in systematically analysing and presenting the data leading to the discussion. The researcher, with the strong commitment of not compromising data interpretation quality, took all the necessary time to capture the fuller scope and maintain the quality in data analysis.

4.6   Conclusion

This chapter has detailed and justified the ways in which a qualitative case study approach involving interviews and a focus group discussion forms the foundations of the research. Primary data were gathered from ten students of varying characteristics who had disabilities, with the majority having a visual impairment. The research was conducted on the campus of the University of Dhaka, over a 16-month period with attention paid to all access and ethical considerations and issues of dependability and trustworthiness. The following four chapters are the findings chapters, where the data are presented and analysed according to their relevance to the four research questions.

Chapter Five: Students' digital technology access and use

5.1 Introduction

This, the first of four findings chapters, deals with the findings related to the first research question:

> 1. How are students with disabilities engaging with digital technologies at university? When – and for what purposes – are they making use of digital technologies while at university?

The chapter presents an initial overview of the provision of technology for the case study students. Drawing on the interview data with the ten case study students, it explores: (i) the digital devices that they were using; (ii) the software tools and applications that these devices allowed them to access, and (iii) the online services and applications that they were using. While these descriptions are relatively mundane, they provide a valuable context for the thesis's subsequent explorations of academic and social uses (and non-uses) of digital technology for a group of disabled students studying at the University of Dhaka.

5.2 Students' uses of digital devices

This study was undertaken with six students with visual impairments, three students with physical disabilities, and one student with speech impairment. Almost all the participants were using a diverse range of digital technologies including mobile phones, computers and audio recorders. Interestingly, all of the participants were using Android mobile phones rather than other phones like an iPhone or a Microsoft phone, indicating that Android phones were more convenient. This reflected a general concern with following established patterns of technology use that were considered effective rather than experimenting with niche or novel technologies.

This reluctance to alter familiar uses was illustrated in the case of Nazat, a female student with visual impairment. Nazat reported having received an iPhone from a relative as a recent gift but assumed that iPhones would be troublesome given that she had been using an Android for the previous couple of years and had become familiar with its operating system. Therefore, consulting with her family, she continued with another new Android phone instead of using the gifted iPhone. Her family agreed that the iPhone might detract from their daughter's practised usage of her phone.

The idea of familiarity with technologies recurred in the interviews. For example, Humayun – another student with visual impairment – was using Android phones and assumed that most students with vision problems were using Android phones. To him:

> *I think most students with visual impairment are using this Android phone, particularly the urban students. Because it has several features that suits our needs well. I have never tried other smart phones like iPhone or Microsoft, however, I heard that Windows phone has some problem regarding software. As we can easily download different software from the play store, in the Windows phone the screen reader software is not that much available yet. I am not very sure about this problem - but I heard from others. That is why I am preferring to use an Android phone.*

Apart from their personal perceptions and preferences, it was notable that most interviewees were influenced by senior students in the university who had been using Android phones. The seniors reinforced the sense of satisfaction with Android phone in terms of software availability, ease of operation and therefore had recommended that incoming students use an Android phone. Interviewees reported that senior students had been a key shaping influence on their entry into the university. There is a tradition in Bangladeshi universities for senior students to take informal roles in many different aspects of university life including course related issues, socialization in dormitories and academic departments/institutes. In some cases, the seniors had become mentors to newly enrolled students, guiding them to learn necessary social etiquette for belonging to the university community. As most of the students were living away from their home and guardians, senior students sometimes assisted them in coping with the new life experiences students faced in academia. This involved following the trend of their fellow students using mostly Androids.

Nine of the case study interviewees had computers of their own. Sagir did not have his own computer during the first round of interviews, relying either on the computer laboratory of his Department and occasionally borrowing friends' laptops. The nine computer owners all had laptop computers, with one participant (Ahmed) using a desktop computer along with his recently bought Core i3 laptop (what he considered to be a 'decent' configuration). Most of the computer users were not particularly knowledgeable about the configuration of their devices - for example, only three could recall the capacity or speed of their RAM, processor and ROM. These students were aware of differences in age and quality of their devices but

tended to express this in vague terms such as "second generation" or "fifth generation" laptop, as detailed below:

> *Q. Can you tell me the configuration of your laptop?*
>
> *Ahmed: I, aa ... aa ... It is Lenovo ... generation five laptop ... and ... what's more?*
>
> *Q. The processor?*
>
> *Ahmed: Core I3.*
>
> *Q. What computer do you have? Is that a laptop or ...*
>
> *Nazat: It is a laptop. The model is DELL and a second generation.*
>
> *Q. Let us talk about your computer. What is that?*
>
> *Utpal: It is a laptop.*
>
> *Q. Can you tell the configuration of that?*
>
> *Utpal: The configuration is ... it is Fujitsu, Fujitsu brand ... and that is Intel ... the processor, and this is a second generation, quite old model laptop. My father bought this in 2013 for me when I enrolled in the university.*

Students obtained these devices from one of two different sources - either purchased for them by family members, or donated to them by various philanthropic organizations. Most Android users had been given phones by family or relatives. For example, Selim received his Android smart phone from an uncle as a reward for achieving good results in the secondary school examinations. However, Iftikhar (an older student in his late twenties) was the only participant who bought his Android himself three months prior to the interview. Six participants had received laptops from families and relatives and three had been given laptops from external organizations. The latter participants were informed that these were awards for examination results and/or winning a competition. These students were reluctant to frame these donations as charitable gifts due to their disabilities. Instead, they described these devices as having been awarded for their academic merit. For example:

> *Humayun: With the assistance from overseas organization some laptops were given from a local organization to the students with visual impairment studying at University of Dhaka on the basis of top results in the university. I got one of them since I had a good result in my academy.*

> *Tamanna: One organization named CDD organized an essay competition, I participated in that. They gave 100 laptops to the top participants, I was one among them.*

While grateful for their laptops and phones, students varied in their enthusiasm for using the devices. A couple of students raised issues relating to the portability of their devices. One participant found his laptop cumbersome - both in terms of its weight and 28-inch screen. That left him hesitant to take it outside of his dorm room. Tellingly, this laptop had not been procured by the student or his family, rather it had been awarded to him by a non-profit organization. As a result, the student was reliant on a laptop that he had not specifically chosen and with which he rarely moved around. This issue of portability was also evident in most students' preference to use mobile phones (rather than laptops) outside of their residential halls. Another student recognized the trade-off between convenience and quality of use, as he reasoned:

> *Humayun: Although computers are multipurpose, which enables us to do almost everything, I mostly depend upon my Android phone. Most of the time it is not possible for me to carry my laptop everywhere I go.*

Indeed, from the interview data it was noticeable that many students' device use was shaped by pragmatic preferences between the quality of what could be done with the device and convenience. Despite being 'always on' as a technology user, Ahmed, a first-year student with visual impairment justified compromising in opting for the reduced quality of 'small-screen' internet access outside of his dormitory in terms of the convenience of only having to carry a smart phone:

> *Usually, I use the computer mostly for study purposes. I also prefer to work on my computers as long I stay in my room in the residential hall for all of my non-study activity like communication, knowledge exploration through the internet or even to compile my distorted thoughts into a piece of writing. Any of the computers are always open whilst I stay in my room. I like to be uninterruptedly connected with the internet. I only use my mobile phone as an alternative means when I stay outside. There, I will use social media like Facebook, Imo, and WhatsApp from my mobile phone.*

Similar sentiments were expressed by Shahdat: "I am comfortable to use the laptop in my study. If I go outside my hall or don't have enough time to open the laptop to read newspapers in the morning, I use my mobile phone then". Likewise, Selim, a student with

physical disabilities preferred to use his laptop if he had sufficient time. In cases where he was not inside his residence or had to leave in a hurry, he opted to use his mobile phone.

Indeed, some participants expressed a blanket preference for using mobile phones rather than their laptops. Nazat reflected that she now only rarely used her laptop since getting an Android phone. She used the laptop to only to prepare term papers or if the phone became 'hanged' and 'troublesome'. Tamanna also used mainly her Android phone; using her laptop to store data from the phone if her mobile memory became full. Humayun also reckoned that he was becoming more dependent on using a mobile phone for studying as well as social uses. He recounted an indicative instance:

> *Once one of my friends texted me asking whether I had the lecture sheets and presentation of a particular course. He was far from my residential hall and the next day there was an exam on those resources he was asking for. So, it was not possible for him to meet with me. Besides, my laptop was not with me at that time. I found the resources in my mobile phone and I could send him them straight away from my mobile to his email. I think this incident reflects my capability in becoming a quick and skilful user of digital technology which is rare in students of my disability type.*

The interview data highlighted a number of ways that these students were configuring their devices in different ways. For example, the students with visual impairments all used their laptop keyboards via standard Microsoft shortcuts. Since they used screen reader software these students did not depend on using a mouse or track pad. Some re-configurations were understandable once explained. For example, even though he had visual impairment, Iftikhar minimized his laptop's screen contrast as his partial vision did not completely obscure the illumination of screen which caused him discomfort. Selim – a student with physical disabilities - had developed an improvized way of using the keyboard and mouse with his paralysed right hand. He had been a right-handed person, however he used the mouse with his left hand.

> *I cannot keep the mouse at my right side while I am working on my laptop (he uses a mouse in his laptop due to his discomfort in using the laptop scroll pad). I need to use the mouse and key board one after another as I use only my left hand to operate it. So, it is not possible for me to use both simultaneously for an activity like dragging or other similar tasks. In case I need to press two different keys at a time on the board which are far from each other to press by my left-*

hand fingers, I have real difficulty to do this. Sometimes I use my paralysed
right-hand finger just to keep upon the required key which is truly useless
sometimes and I need to do trial and error for several times to correctly put my
finger on the exact key. In rare cases I use a pen or similar-shaped object by my
right hand to press any key to co-ordinate with the left hand.

Both the students' experiences illustrate the personal and often unorthodox ways that students with disabilities were using technology, while remaining relatively 'ordinary' users. Indeed, this initial analysis of data has focused on the relatively prosaic issues of students' digital technology ownership and use. Here we have seen nearly all students had access to devices and they were in many ways comparable to any other young technology user. They often preferred to use devices that were convenient and portable rather than because of the quality of use, meaning that most students' access to the internet was primarily compromised by the small screen. The interviews also highlighted the importance of the means of procurement, how the devices entered the students' life. In particular, the data pointed to the significance of family, philanthropic organizations, fellow students, and senior mentor students who all played a role in shaping how the devices were engaged with. While the students clearly engaged with devices within the confines of their specific disabilities, in many ways their uses could be judged similar to those of non-disabled students. Of course, these descriptions still tell us little of what was done with the devices. The next section explores the range of software applications the students were using on these devices.

5.3 Students' uses of software tools and applications

Nearly all the students with visual impairments used a common, core repertoire of applications and software for their computers and phones. Everybody was using some form of screen reader software for converting what was being presented on screen as speech. *Job Access with Speech (JAWS)* and *Non-Visual Desktop Access (NVDA)* were the most popular screen reader applications which students used on their laptops. For phones, a few students were reliant on *Talkback,* a pre-loaded Android phone application. Others preferred using different phone-based screen readers, such as, *Shine Plus, E-speak, Eloquence,* and *Super Nova.* Shahdat reported he switched to using *Google Text to Speech (TTS)* since he found *"...* [Google TTS is] *accessible to read pdf files which* [previous applications] *could not. Besides, this one has clearer audio that makes it seem like I am listening to news in television-* [it is] *that much clear".* Almost all of the students with visual impairment were also using *Open*

Book software for reading texts and graphics based documents which were inaccessible by *NVDA* and *JAWS*. Alongside these assistive applications and software, all the students with visual impairment reported using preloaded software like *Microsoft Office* packages, various media players and *Adobe Reader*. Some talked about using the basic Windows in-built screen reader, *Narrator*, while other students installed their preferred screen readers.

Besides these commonplace applications, only a few students were making use of more specialized tools and software. For instance, Iftikhar mentioned his preference to use *Video Cutter* to download audio-only versions of video files. He did this in order to minimize data usage, *"Since I am paying my internet data, I don't want to download the video of any file. So, I used to use Video Cutter software to just download the audio which is sufficient for me as a person who cannot see"*. This student also made use of a few preloaded applications in his Android phone (such as *Call Recorder*) to record phone conversations and *Call Name Talker* that identified who had called/texted him, *"It really reduces my stress to remember tricky numbers, street names even road directions from phone conversations"*. Humayun had used another application called *TapTapSee* to listen to audio descriptions of objects in photographs.

All four students with physical disabilities were using what they saw to be the 'natural' range of applications, namely, the Microsoft Office suite (mostly for study purposes) and some entertainment software for their leisure time. One student, Selim, was learning German and French languages through a free language learning application *Duolingo*. Utpal made use of the preloaded dictionary in his phone to improve his vocabulary. Despite their impairments, the students with physical disabilities were keen to describe themselves as using all of the software and applications which any non-disabled student was using in the university. They had described themselves as 'normal' users of technology. Utpal stated:

> *I use almost all the features of my laptop and mobile phone that a normal student does, nothing extra in terms of software and applications. I just use my one hand – that may be the single difference from 'normal' students' use.*

While Sagir said:

> *I am doing everything with my phone as any 'normal student' would do; from Facebook to all other functions of Android phone. I consider myself a 'normal' user.*

As it is common practice in Bangladesh, all the students were using pirated 'cracked' versions of these applications and software. These cracked software were sourced from an assortment of informal contacts, such as friends, senior students, family members and even some staff of the charity and philanthropic organizations who supplied most of the technology resources they were using. Ahmed reflected:

> *We only use those software programs which are free to us. For the paid software I search for cracked versions. In our country, I assume only five to ten percent of people use an original version of Windows, the rest are using a cracked version. Indeed, because of this, we are unable to get all the features of Windows and other 'genuine' software. But these cracked programs are enough for our need.*

Sometimes students downloaded free software for themselves from the internet. As Humayun detailed, "I downloaded JAWS and other screen readers from 'Freedom Scientific', a web page that allows us to get the cracked version of necessary software without paying for it". Although much of the software they were using were not original versions, the students reported they were satisfied with these free substitutes. Often this meant that students were not using the most recent versions of any software. Humayun explained using JAWS 16 whereas JAWS 17 was available on the market, reasoning that he had become accustomed with the previous version by customizing settings. As such, he was unwilling to install the updated JAWS for fear of resetting his personalized settings.

Senior students in the university were reported as playing a vital role in supplying necessary cracked software and applications. Some senior students also played a consultancy role if students then experienced any trouble regarding these applications. Tamanna recalled her early experiences with her laptop:

> *When I got the laptop from the organization, I found that it did not have any screen reader. I was quite helpless and could not understand what I should do with a laptop without any screen reader. Then I talked with my senior students who had been using screen readers in laptops as well as on mobile phones. They took my laptop and installed all the necessary software for a 'blind' student.*

Sometimes the senior mentors directly supplied particular software to a student, with there then being a subsequent handing-down of software from senior to junior students often through three or four iterations. Sometimes the students did not know who supplied a

particular original version of the software. It was evident that there was a culture throughout the University of sharing and supplying software. Indeed, occasionally interviewees had obtained software from non-disabled seniors or friends. This reliance on social support extended to developing skills to use different applications and software. Ahmed commented that he had been taught by a sighted friend who was studying Computer Engineering. Shahdat had also benefitted from his senior roommates in his dorm who had taught him to operate Optical Character Recognition (OCR) to convert any printed material into text files. This meant that he could now scan any book or printed material and convert it to a readable format by *Open Book* screen reader software. Another student, Humayun, had been assisted by sighted senior roommates guiding him through the installation process of applications in his Android phone.

Indeed, audio-based assistive applications were a core part of the visually-impaired students' technology use. Students with visual impairments reported using pre-loaded recording applications on their mobiles to record class lectures, record sighted friends dictating printed learning materials and also to recording conversations from study groups. These recordings would sometimes be typed-up in word processor files. Ahmed described his usual technology practices:

> *I transfer recorded files from my mobile to my computer through data cable. Then I open the recorded file with any audio playing software and start my screen reader to write down necessary information/ points from the audio record. I use Microsoft word for my writing purpose. I do not write in Braille system any more after becoming dependent on writing on word. Screen readers also allow me to edit my writing, and the most important outcome of this self-dependency is, any other sighted person can read my write-up in a Word file. Moreover, I can print out my writing for another person. With the help of an OCR and Open Book software I can even read any others' printed copy. Thus, I feel the gap between a non-disabled student and me is reducing.*

Shahdat had been using his Android phone's pre-loaded recording software for what was said by lecturers and students in lectures and classes, as well as the audio of television programs related to his academic study or his personal interest. Other students with visual impairments were using Microsoft Word mainly to produce their assignments. A few interviewees also reported prevalent non-academic uses. Ahmed was an activist, using Word to produce poems, articles on different issues including disability, a journal recounting his experiences as a

person with visual impairment and an occasional diary entry on his daily activities. Iftikhar was also a user of MS Word to upgrade his curriculum vitae. He explained:

> *As I am about to complete my Masters, I search and apply for suitable jobs. For this, I need to frequently edit my CV regarding the advertized job requirement each time before I apply for it. For this I use the Microsoft Word program with the JAWS screen reader.*

Students with visual impairments were clearly dependent on screen reader software both for their computers and mobile phones. Shahdat commented, *"I cannot think about using technology without screen readers. The computer and phone are quite impossible for me if I do not use screen readers"*. Humayun also acknowledged his screen reader as the 'base ground' of his technology experience. Yet these students' specific choice of screen reader differed according to personal preference. Almost all of them were using JAWS for navigating English. For Bengali language software they switched to *NVDA* or *E-Speak*, since *JAWS* was not capable of reading the local language. Ahmed always used *NVDA* to read both English and Bengali as he wanted to minimize the difficulty of switching between material which contained both Bengali and English. He reasoned, *"Sometimes I find some mix-up of both the languages (English and Bengali) in my friends' Facebook activity or on any page. JAWS is just useless to read the mixed lines. So I always use NVDA which is efficient for reading both English and Bengali"*. However, Tamanna and Iftikhar expressed dissatisfaction with using *NVDA* due to what they perceived to be its unpleasant English voice quality and pronunciation. Tamanna criticized:

> *Compared to JAWS, NDVA has very bad pronunciation of English. That is the reason I have been using JAWS in my laptop and for the mobile phone I have been using Eloquence and a pre-loaded application, Talkback. Our seniors had always suggested to use NVDA but I stuck to JAWS.*

Iftikhar's choice was based on his perception of functional problems while using *NVDA*-although it was grounded more in his familiarity with other packages. He gave an example: *"In NVDA, it will only give the command 'Control+A', but in JAWS it will say "Control+A selected'. I know it may not be an issue to other NVDA user but I have been accustomed to listen to the 'selected' word as a postlude of the voice command"*. Interestingly, both Tamanna and Iftikhar still chose to use *NVDA* for their mobile phones.

Indeed, students had a diverse range of choices regarding mobile phone screen readers. Ahmed preferred to use *Shine plus* rather than the pre-loaded *Talkback,* which he had been using for the previous few years, as he found *Shine plus* to be more accessible in terms of transferring from one mode to another. He explained the issue:

> *I do not feel comfortable with Talkback any more as I feel Shine Plus has a more convenient function to shift the reading mode from character to word and sentence mode. I experienced with Talkback that if I needed to learn any new word spelling, Talkback was difficult to set to character mode from word or sentence mode. So I could not get the letters of a new word in Talkback, whereas in Shine plus I can easily set which mode I want to listen to during any particular reading.*

That said, Ahmed was unsure whether the problem with *Talkback* had been rectified in updated versions or not (indeed, other interviewees suggested that it was not a problem in their experience). Sometimes students admitted being unsure if difficulties were due to a problem with the application or their own ignorance in using the technology. Iftikhar mentioned one specific problem regarding creating a new folder with the assistance of his screen reader, but he had not explored how he might overcome the problem. He suspected that this problem might occur due to his insufficient skill on digital devices.

Students reported few problems regarding the applications and software they were using. That said, almost all students with visual impairments complained that their Android smart phones would occasionally freeze and they were required to restart the device that caused them to lose the assistance of the screen reader. Conversely, if they required assistance operating their phones from sighted people it was often difficult for the sighted person to work with the screen reader. Due to this, some interviewees said they were reluctant to ask for assistance from unknown people. It was certainly clear from the interviews that when students encountered problems, they would develop idiosyncratic ways of dealing with the problem. This did not necessarily involve solving the problem, rather getting around it and drawing upon friends and bystanders for assistance. Humayun commented that if his phone froze or shut down, then he needed to rely on sighted people since their screen reader did not work at that time and they needed to restart the device and find the screen reader manually from accessories or another menu.

5.4 Students' uses of online applications and services

All the students were keen users of the internet. All of the participants had talked about their social media activities, online sharing of content, links, stories, videos and a general reliance on the internet for both their studying and leisure activities. Most of the students had learnt about online activities from friends, family members and senior students. Additionally, some had learnt basic internet skills from computer training prior to enrolling in the university (however, this was not judged very useful). All interviewees reckoned their online skills to have developed mostly through trial-and-error involvement with the internet. Some of them admitted that there was room for them to improve their expertise in online activities.

The main online interface being used was the web browser. The students had a diverse range of browser preferences. Some reported using different browsers for particular online activities. Some students switched to other browsers on a regular basis. For students with visual impairment, these choices were influenced by the variable compatibility of browsers with their screen reader software. Two students described their reason for the selectivity:

> *Ahmed: I use multiple browsers for different purposes. When I read online newspapers, I like to use Mozilla Firefox since I found it more advantageous than Google Chrome while scrolling web pages with my screen reader. Furthermore, occasionally with Chrome the screen reader does not speak or it feels troublesome to move up and down smoothly. However, I use Google Chrome to watch online live sports or the news channel. To watch live events Mozilla requires installing Adobe flash player software which I think creates some issues with other installed software in the device. So, people are not preferring to use this software particularly for watching live online events.*

> *Iftikhar: In my Android, most of the time I use the UC browser that was suggested by one of my seniors. I prefer to use this browser rather than Opera Mini because the latter does not support the NVDA screen reader to read Bengali language. The UC browser is sometimes also unable to support NVDA, but it supports the screen reader to read everything written in Bengali on Facebook.*

Students' browser preference clearly related to what they were attempting to achieve. Their choices were often influenced by the perceived speed of each browser. Utpal criticized *Mozilla* for making the internet speed a bit slow. He reported difficulty when using the *Internet Download Manager (IDM)* in *Mozilla*. Therefore he had switched to *Google Chrome*

which enabled him uninterrupted downloading as he found *Chrome* had many features that he could customize according to his choice. Apart from *Chrome* he also preferred *Opera Mini* as he explained, *"Each time I open a new tab I find the previously browsed pages are being shown on my home page. It helps me to get quick access to my most visited web sites without writing the address each time"*. In contrast, Sujata preferred to use *Mozilla* since she found *Opera Mini* seemed to run at slower speeds to connect to the web.

All the students were using social media applications such as *Facebook, WhatsApp*, and *Twitter*. Most were frequent users of core online platforms such as *Facebook* and considered these as fundamental means of connecting with friends, fellow students and occasionally the university. *Facebook* was reckoned to be the most commonly used social media among the students. All interviewees perceived it as a core means of online communication with friends, classmates, the wider community of students with disabilities, and people who were otherwise unknown to them. Humayun summarized the benefits of using *Facebook* for him:

> *I spend quite a long time on Facebook. And that's for communication and obviously for getting information regarding issues of my interest. I can easily get connected with my friends with it. Prior to using Facebook it was rare that we talked on the mobile phone for a long time as it was not possible for us to afford the excessive phone bill. So the communications with old friends and relatives became infrequent. Apart from this, in Facebook I can also get updated information which was not so easy before. We have many Facebook groups for different interests that provide instant updates of any event. For example, we have a group for the university student Transport service. In this group the admin always updates the changed schedule of the bus and if there is anything urgent to know regarding the bus trip.*

Some students also talked about *Facebook* groups which enabled them to link with people with disabilities all over the world and more locally. Shahdat described what such groups facilitated: *"I am following Facebook group of 'Dhaka University Visually Impaired Students' for obtaining information about any meeting of this organization or any important issues related to our rights. I always get their notification on my wall that helps me to be updated"*. These groups also helped students become informed about disability-related technological issues, for example, any trouble-shooting for devices and software. They felt able to enquire about technological problems in the groups and someone would usually reply with suggestions.

Utpal used *Facebook* as a platform to share his thoughts and writings on different issues that helped him to get feedback from his contacts. He explained, *"I love to write on Facebook to express my thoughts on any particular issue. I also engage myself in arguing with the people who oppose my thoughts on Facebook posts. It is really very exciting for me to defeat others by counter arguments and establish my thoughts over theirs"*. He added that *Facebook* also helped him to learn more about his friends' political philosophies from the tone and content of their activity and posts. This allowed him to identify who had similar ideologies to his own and who did not. On a more prosaic level, he talked about using the *Facebook* group to get subtitles for English movies as he found the accents of many movies difficult to understand properly.

Given the pattern of frequent *Facebook* usage by the students, Humayun justified this in the following comment by indicating the central role that the platform seemed to play in the lives of many students:

> *Well, I accept that Facebook occupies most of our time; but it also helps us to become more competent users of the internet by connecting with other people and groups. I keep myself updated about the world through Facebook. These days, I don't need to read newspapers – Facebook provides me all the news around the world just on my wall.*

The interviews suggested that, apart from *Facebook*, most of the students had not been frequently using other social media like *WhatsApp* and *Twitter* (although most reported having a *WhatsApp* account). Only Utpal mentioned having a *Twitter* account and accessed it infrequently to follow celebrities and share interesting content. *WhatsApp* was more frequently used among the students than *Twitter*. Half of the students reported using *WhatsApp* as a tool for collecting information and communicating with other users regarding common interests. Ahmed talked about several *WhatsApp* groups, namely *All About Information, Accessible Android Bangla, V2I, Bengali Tech Expert* that had supported him in getting acquainted with new technology, sharing problems regarding devices or software and also discussing issues related with his visual impairment.

Many interviewees had also used *Imo* and *Viber* to communicate with friends and families since most of the students were living in university dormitories away from their family homes. Some students had switched from *Skype* to these alternatives as they found *Skype* to be complicated when opening up an account. Utpal also reported data consumption to be excessively high with *Skype*. The students also used email, although they reported email

communication as occasional since *Facebook* covered most needs to communicate with people. Iftikhar reported only using email on occasions where he needed to send files to people or organizations who did not have *Facebook* accounts. Interestingly, Tamanna had never used email, although she had established an email ID:

> *Most official correspondence of non-profit organizations had been performed by emails. Although I never communicated with them through email, I thought someday this email ID would become an important channel of contacting them. I am not requiring email now, but eventually it could be necessary. Additionally, everybody around me has email, so for keeping pace with them I should also have one. Otherwise, they may think I am not in their row and live in a backdated world.*

Students also reported going online to read newspapers and for various entertainment activities. All of them used *YouTube* for watching movies, listening to music and for watching different tutorials for hobbies and informal learning. Selim depended on *YouTube* tutorials to solve problems related with his technology usage. He stated an incident where he helped connect *Wi-Fi* in a friend's newly installed *Windows Seven* desktop computer. He did not know the solution at that time, but was able to learn from *YouTube*. He perceived that, helping a non-disabled student regarding a technological issue had increased his social reputation in the dorm.

Interviewees' use of the internet for their studies was a little less varied. Each of the students used *Google* to search topics related to their academic study. They mostly searched topics which they found difficult to understand from text books and lecture sheets. Therefore, they looked for some resources that were easier to understand. Utpal used *Google* to find course-related materials with illustrations and simple examples to help him obtain basic understanding of a topic which he otherwise had not understood from his institutional course books. The students also acknowledged their dependency on *Google* for obtaining important material prior to any class presentation or assignments. Utpal and Sagir talked about using *SlideShare* for downloading presentations from other universities that were similar to their own assignments. Sujata reported that her teachers sometimes suggested classes to find and read any topic from the internet prior to attending the next lecture. Shahdat detailed that occasionally he listened to recorded lectures of his classes and read referred academic articles from *Google* and *Wikipedia* at the same time. He found this approach helped him link his teacher's lecture content with other authors' reflections on the topic, and thus he could

augment his learning. Beside this, Selim also highlighted a resourceful communal use of *Google* as a tool for developing general knowledge:

> *In my dormitory each night a few of my dorm mates and I participate in a general knowledge quiz session where if we need to know or clarify any information we can find it from Google by just a click on our Android. But when we did not have internet facilities, we needed to search in general knowledge books which was truly time consuming and required us to depend on books or encyclopaedias.*

Facebook was also reported as a significant study-related tool for many students. *Facebook* was a ready means of finding out class information and examination schedules, sharing important learning resources and being updated by the pages and groups they had been following. All the interviewees followed their department/institute's *Facebook* group, as well as their own study/batch groups which had been administered by class representatives. These class representatives collected materials from teachers and disseminated them amongst the batch group. In this batch group, sometimes students would discuss particular topics and share useful links, articles, reading materials and even suggestions of questions for upcoming examination. Beside these specific closed groups, the students with visual impairments reported following a few open groups like the *Writers and Recorder Group* which helped them make contact with sighted students around the university who could help to dictate any printed material for recording and, most importantly, who could attend as a sighted writer for a student with visual impairment. This group had been formed by both the sighted and students with visual impairments of the university. Humayun explained the function of this group, *"Before any examination I post to this group asking for a sighted writer by mentioning the schedule and venue of the exam. If any sighted member of this group is willing to help, s/he contacts me. This is totally voluntary; we don't need to pay for this"*.

Utpal was enthusiastic regarding the use of *Facebook* for supporting his academic studies. He commented:

> *Nowadays, Facebook covers all the needs of our learning. Even sometimes I don't need to google for any new thing; my wall is sufficient for me to learn from all the pages I follow. For example, I follow a local English newspaper in Facebook. Their page regularly updates vocabulary lists from where I can learn new words. I don't need to necessarily google the word; from the list I just search the word that I need to know. Thus, most of my online interaction is*

The students reported making far more use of email for academic purposes than they did for social purposes. Email was used to communicate with teachers and tutors regarding any course-related issues like asking for study material, useful links and for submitting assignments. As some course teachers did not prefer *Facebook* for online communication with students, the students needed to use email instead.

Online video was also an effective source for the students to learn various things. Shahdat and some of the others were using *YouTube* for course related discussions, talk shows and speeches by renowned scholars of particular fields of study. They sometimes made use of *YouTube Downloader* to save any video into their devices to watch later. Selim was a varied user of different online learning platforms such as *Khan Academy, FutureLearn, Alison, or TEDx* to learn the topics which he could not learn from his own university classes. He detailed how the topics discussed in those online learning sites had helped him to learn a range of content that exceeded what he was learning in his undergrad course. Although he was studying Psychology in the university, he had developed an interest in physical sciences. These videos had helped him learn beyond his university studies.

All the students reported minimum disadvantages in using internet despite their disabilities. However, their actual engagement with the internet was clearly compromised for a number of reasons. Some of the issues were related to their disability, however, many problems were due to inaccessibility of the internet and lack of skill and expertise inonline activity. One of the main impediments was the quality of connectivity. Iftikhar and Tamanna complained about the university's variable connections, which sometimes did not allow internet access. In his dormitory, Iftikhar had free *Wi-Fi* connection in a few limited areas outside of his room. Often it was not possible for him to carry his heavy laptop to these *Wi-Fi* areas. In addition, Iftikhar was reluctant to work in public areas since other students of the dorm who were also using the internet from the *Wi-Fi* point might be disturbed by the noise from his screen reader. Due to his financial constraints, it was not possible for him to pay for a broadband connection in his room for individual use. Tamanna reported that her laptop could not be connected to the free campus *Wi-Fi* due to an unidentified problem with her laptop. Therefore, like other non-disabled students she had attempted to get approval from the dormitory authority to get a broadband connection in her room, but the authority had so far denied her. Since she had been the first student with visual impairment in the girls' dormitory

who had asked to use the internet, the authority was not convinced enough to permit her, giving the reason that *"what [would] a 'blind' girl do with the internet?"*.

Ahmed reported being unable to access some web pages which were not compatible with screen readers. Moreover, he found the *Baidu* browser was not always accessible for users with visual impairment as occasionally screen readers could not read web pages properly and in many cases it was difficult to use the keyboard to give screen reader commands. Iftikhar also reported a few Bengali web resources, which were in image format, since there had been no screen reader which could read a Bengali image/graphic file. He explained, *"Most of the government websites publish their official circulars, policies, and job advertisements in pdf format. I experience trouble reading these as screen readers still cannot read Bengali pdf files"*.

5.5 Discussion

These findings highlight that in most cases the disabled students were using digital technology not only to support their daily needs but also toward achieving self-dependency and becoming (in their own words) 'normal'. As Morosanu et al. (2010) explained, technology uses are strongly connected with lived experiences; a similar phenomenon has been observed for this sample group. These students not only used technology to portray themselves as perceived normal students, but also, they claimed to be the 'normal' users of the technologies themselves, as the data have shown.

The interviewees were certainly heavy users of smartphones and laptops, and were using basic applications and software for both study, entertainment and socialization. Again, like the majority of technology users, these students were engaged in relatively mundane, need-oriented uses of technology which is part of the socialization process and therefore, seen to be worth investing efforts in, as also supported by Lairio, Puukari and Kouvo (2013). As such, the students were 'normal' users in terms of most of their habits, perceptions and practices regarding technology. For example, like most of the users in Bangladesh they were reliant on pirated cracked versions of popular software. Most of the time they were happy to rely on informal, peer-based solutions to technology problems instead of engaging themselves personally in solving the issues they had. It seemed that they were not particularly driven to acquire new skills additional to their current practices and expertise. Thus, it could be said

that the students were engaged in extensive but largely mundane uses of technology similar to those of their non-disabled peers.

This use of technology was clearly part of the students' identities, both in terms of their personal self-identity and their more specific 'student identity'. It was evident that there was a difference between these students' perceptions of themselves as people and students, and their institutionalized identity as 'students with disabilities' in the university. Scholars perceive the term 'social identity' as a context, a level of cognition and as including the behaviours of a person that help to provide an understanding of the way in which they perceive themselves socially (Ashforth, Harrison, & Corley, 2008; Bliuc, Ellis, Goodyear, & Hendres, 2011). Similarly, in particular, the students with physical disabilities described themselves as 'normal' in terms of their daily living activities as well as technology experiences, reasoning that, with few exceptions, they had never been unable to use technology to cater to personal, social and study needs.

Sometimes digital technology did seem to be enhancing the interviewees' sense of being 'normal' students. Almost all of the interviewees expressed a sense that their ability to use digital technologies played an important role in presenting themselves as 'normal' students in the university. Selim's excitement in helping a dorm mate install software was recounted in terms of him using his technological expertise to promote for himself an equal (or even superior) status in the eyes of his non-disabled peers. In addition, most of the students interviewed had been involved with several online groups which had created an opportunity to engage in wider communities where they could participate without the direct labelling of 'disability'. On a more practical note, lecture recording and screen reader software had made students less reliant on asking peers for assistance.

Yet, while the interviewees saw themselves as using technology in ways comparable to non-disabled students, they were clearly compromised in different ways. Students with visual impairments remained reliant on specialist assistive technology, such as screen readers, recording devices, different software for computer-connected scanning and reading devices, and so on. These technologies were clearly shaping their experience of technology while in university. This was most starkly illustrated by their reluctance to use 'noisy' screen reader software in public spaces for fear of disturbing other students. Moreover, when devices 'crashed' or failed to work, students with visual impairments were completely reliant upon other sighted peers who usually found it difficult to troubleshoot software designed for users with visual impairment.

These interviewees were also reliant on others for the provision of their technology – including senior students, peer groups, family and philanthropic organizations. In some cases, it was noteworthy that other people were undertaking direct procurement and maintenance of technology on these students' behalf. Several students such as Ahmed, Humayun and Nazat had been assisted by their siblings and personal teachers to collect necessary software, upgrades, and most consultation regarding new devices and applications. Keane (2011) supports this argument and also adds that the social network plays an important role in higher education and future job market prospects. The data from this study also support Bourdieu's (1986), argument confirming that one's network of peers has an immense impact on shaping social capital. Another critical shaping influence was that of 'disability communities' within the university, particularly senior mentoring students who were a key source of advice, guidance and problem solving regarding the interviewees' technology experience. In addition, philanthropic organizations had procured laptops and software, which meant that students could not be selective in choosing computers which suited their needs. Given these issues, the technology experiences of the interviewees could be said to be significantly configured by other people. This also meant that participants sometimes had no other way but to adjust to what they had been given. The impact of reliance on other people was supportive and limiting – supporting functional use but perhaps limiting the development of skill, confidence and independence. The next chapter provides further insights into these matters.

5.6 Conclusion

This chapter – the first of four findings chapters – has dealt with the general topic of students' digital technology access and use. It explored the students' use of digital devices, applications, and particularly online applications and services. The result of this is that their use is extensive – comparable to the use of non-disabled students. However, it is also within the framework of needing assistance – more assistance than that required by non-disabled students. The following chapter extends the findings of this one in focusing on enablers and challenges to students with disabilities.

Chapter Six: Enablers and challenges for students with disabilities

6.1 Introduction

This chapter about enablers and challenges is the second of four findings chapters. It deals with the findings related to the second research question:

> 2. What challenges and barriers do students perceive as hindering their use of digital technology while at university? Conversely, what factors appear to be supporting and enabling their engagement with digital technology?

This chapter looks at both the supporting enablers and the challenging barriers, which have been drawn from the data collected from the ten case studies through semi-structured interviews and focus group discussions. Enablers are discussed first, and then challenges, before conclusions are drawn, which reveal the actual state of affairs for a small group of Bangladeshi disabled students, who likely represent a much larger population.

6.2 Enablers

The participants mentioned a number of enablers and drivers which had supported their digital technology experiences. From their perspectives, these enablers not only made them able to operate digital technologies, but they also strengthened their ability to cope with further technological issues as they arose during their overall technology experience in HE. The primary enablers mentioned are:

- Support from family, friends and seniors.

- Philanthropic and other organizations.

- The drive to be 'normal'.

- The drive to succeed.

- Free and pirated software.

- Enablers acting as challenges.

6.2.1 Support from family, friends and seniors

Family support was recognized by the students interviewed as an important enabler for them in experiencing digital technologies. Almost all of the participants reported that their families provided digital devices and all other expenses related to their technology use, including hardware and software purchase, internet data costs, training program fees, maintenance and so on. Some of the students related that their family members were supporting them by informing them of any new product related to their technological needs. They also reported that their families were keen to help them by troubleshooting any issue that the students could not solve by themselves, as well as lending their own devices if their children/siblings did not have any. The following quotes clearly describe the nature of family support in regard to enabling digital technology experiences for the students with disabilities:

> *Ahmed: I have a younger brother studying in another university who always helps to find out the appropriate software for me. Besides, he engages himself in searching for any update of the software/application I use. Whenever I cannot solve any problem by myself, he researches on that issue on the internet or asks his friends to solve my technology related problems. He sincerely tries [to find] how technology could be more accessible for me.*

> *Humayun: My elder brother is a person with visual impairment who has been using computers for so many years. Before I got my laptop I used to work on his computer and I learnt so many things from him. This opportunity helped me to retain as well as upgrade my computer know-how that I initially acquired from a computer training programs I participated in a few years before.*

Friends had also been playing a supportive role in the digital technology experiences of the participants. It was interesting to find that as well as their friends with similar disabilities, non-disabled friends were key enablers for them. However, friends with a similar disability were reported to be more helpful than friends without disabilities, who could only support the participants with general technology issues, Such non-disabled friends were not familiar with particular digital technologies which were relevant (for example, screen readers) for use by students with disabilities, as they had not used these technologies themselves.

Support from non-disabled friends primarily included dictation of printed material for recording, scanning hard copy material for accessing with Optical Character Recognition, solving general technological issues, supplying common software like the Microsoft Office

suite and virus protection software, searching the internet on behalf of the friends with disabilities, and so on.

Most of the participants said they were more reliant on their non-disabled friends in their early days of technology experience. Sujata detailed her first few days' experience with her Android phone:

> *When my family bought me this phone, I knew nothing about the phone's operation. At that time whenever I got stuck at any place and did not understand what to do, my roommates at the dorm helped me a lot to resolve the issues. I have learnt so many things and am still learning from them.*

Tamanna had visual impairment. She pointed out another helping pattern of her sighted class mates who used to remind her to switch on her mobile recorder before the teacher started lectures. She also added:

> *My sighted class mates helped me to put my phone recorder on the teacher's desk. That helped me to get clearer audio of the lectures. Some of them were so passionate for me that if my phone did not have sufficient battery charge, they [would] lend their phones to record the lecture and supplied me the recorded audio file in a pen-drive so that I could transfer the lecture into my device.*

As well as this, it was evident from Nazat and some other students' statements that their non-disabled friends had been encouraging their technology use and sincerely wanted to help. Humayun said he was praised by sighted friends for his technological accomplishments and endeavours to learn more about digital technology, as he detailed:

> *My [non-disabled] friends were really good help for me. They sometimes gave me the inspiration to become a more competent user of technology. If I don't understand any issue I just voice call them most of the time and they try to give me [the] proper solution. It's true that not all of them [replied cordially] to my queries, but I have some close friends who never disappointed me.*

However, Iftikhar shared an insight regarding the reason of non-disabled friends' help:

> *I assume, my (non-disabled) friends are happy that I am using technology because if I was not able to use technology, I might have been more reliant on them for each instance in my study. Since I have become self-dependent about so many things regarding my study with the help of screen readers and other assistive software, I do not necessarily bother them all the time. My ability to*

Friends with similar disabilities played significantly different and more important roles in enabling the students to use digital technologies. In fact, they had been one of the major supply chains of software and applications, and information and technical advice required by students with disabilities. These friends were not limited to their peer groups, and in most of the cases it was found the participants established a friendly relationship with senior students with disabilities. These seniors were highly praised by the participants for their continuous support, sincere advice, and altruistic attitudes towards almost all of the needs and problems experienced by the participants regarding digital technology. As well as having senior students from their own department/institution, the participants were privileged to also have senior dorm mates since almost all the participants resided in student dorms. Sometimes they even had senior students with similar disabilities in the same room. This co-residency favoured the students in that they felt they could visit seniors' rooms at any time to seek hands-on solutions regarding any issue related to technology. Alternatively, they could and did also communicate with seniors by phone for help with technological issues. Iftikhar expressed his gratitude to his senior mentors for allowing him to call at any time to get help when he had been a novice technology user:

> *At the beginning when I was totally novice about my phone and laptop, I used to call some of my seniors on every occasion I had problem or I needed to know a device function. They had been so nice to answer my silly queries.*

These seniors were more helpful in the early days of the students' experience with devices and software. Tamanna expressed her first few days' experience with new devices as follows:

> *The laptop I got from the NGO was not equipped with any screen reader software. Without it the laptop was not accessible to me. Then my senior brothers who had excellent knowledge of software for 'blinds', installed the necessary software and other things on my laptop. Then I could use that.*

6.2.2 Philanthropic and other non-university organizations

The participants acknowledged different philanthropic organizations' support in procuring digital devices and supplying necessary software. As was mentioned in Chapter Five on students' digital technology access and uses, some of the students were provided with laptops

from various organizations working to support people with disabilities in Bangladesh. This is because many of the students stated that insufficient financial means (or assistance) prevented them or their families from purchasing a computer. Therefore, support from these organizations had been a pivotal driver for the participants' digital technology experiences. Without the computers or laptops that were provided, most of the participants in this research would not have been able to access computer technology at all, or develop related skills, as most of them (six) were visually impaired. They would have been unable to access the university computer laboratories as these were not equipped with screen readers and other necessary software to enable students with visual impairment to work there. However, it was not just computers that the students needed. Tamanna's case is worth noting because of her long wait to buy an android phone:

> *After my school certificate examination, I started to use a feature mobile phone with which I could only do limited functions like texting and calling; at that time, it did not support any screen readers and had no access to the internet. I heard other students [with visual impairments] were using smart phones to work more efficiently. But my family could not afford to give me such a phone at that time. Till then I had developed the desire to one day also use a smart phone. I started to save money from then and just recently I bought an Android phone after four years' saving.*

It was assumed that as it took four years for Tamanna to save to buy an Android mobile, which is much cheaper than a laptop, that it would be completely impractical for her to initiate such savings again to buy a laptop herself. Eventually – two years ago – she was provided with a laptop from an organization working for people with disabilities. This procurement was indeed an immense enabler for her as she was then able to make use of the device both in her study and in her daily living.

The philanthropic organizations had also organized computer training for students with visual impairments on the basics of computer operations as well as the use of the internet. As most of the participants were from schools and colleges in rural areas, where they had not had the opportunity to become acquainted with digital technologies, the training programs offered by different organizations had remarkable impacts on their technology experiences. Humayun detailed:

> *In our country there are several institutions who offer computer training for people with visual impairment. I assume almost 90 per cent of such students got*

training from those institutes and most of them had their first experience using a computer in their life.

Tamanna also stated that in the computer training she participated in, this was the first time she had ever used computers, or even realized that people with visual impairments could use digital technologies just like non-disabled people could.

Unlike the students with visual impairments, the three students with physical disabilities and the one girl with voice impairment had no opportunity to receive such technological support from any organization. They obtained their devices from family or relatives and relied on friends for software assistance and/or other technological support. They also participated in basic computer training organized by various commercial ICT training institutions and funded by their families. The reason for this type of differentiation by philanthropic organizations in device procurement and free training for people with these two forms of disabilities was not known to the participants. Some of the participants with physical disabilities assumed that since they were able to use digital technologies in almost 'normal ways', and students with visual impairment had different and perhaps greater needs than themselves, it was reasonable to give priority to students with visual impairment. However, Sagir mentioned, that although he had six months basic training in a technical training centre, he forgot most of the skills learnt from that training because he lacked a personal computer. He emphasized that procurement of a laptop from an organization could enable him to retain the skills he learnt from the training and to fulfil his study-related technological needs on his own instead of depending on his friends' charity to allow him to use their computers when in extreme need.

6.2.3 The drive to be 'normal'

Data highlighted that the ten students of this research had all been very motivated and determined to use different digital technologies. This self-motivation acted as a great enabler for them. Beside the other drivers discussed above, this inner desire of the students' to learn using different features of technology significantly impacted their experiences. From what they explained in interviews about their willingness and enthusiasm to use technology, it could be summed up that the students' self-motivation had been shaped by a number of factors, with perhaps the most important one being their desire to be 'normal' or at least equal to 'normal'. They wanted to be able to have the same habits and lifestyles and opportunities

as everyone else, and to work towards this. For example, Nazat explained her 'obstinacy' to learn to use a touch phone despite her blindness:

Utpal expressed his motivation to use technology to 'keep pace' with his non-disabled peers. He perceived this use as his way of 'survival' in a very competitive society. This attitude and desire of the participants to be 'normal' had inspired them to some extent to avoid dependency on others. Ahmed is one who strongly expressed his disinclination or unwillingness to be dependent on others by saying:

> *I hate to be dependent on other people, so I try to avoid asking for help from everyone around me. I always engage myself to accomplish my work by myself. Rarely do I depend on others. From reading in newspapers I got to know that people like me are becoming more independent by using technologies. I got the idea that if I can use technologies properly I can minimise my dependencies. Everybody around me was using a touchphone. It became a trend of my generation. But people labelled us as 'blind' people who cannot use that type of smartphone. I thought, why should I not use it? We can use computers despite of blindness!*

> *Who knows, maybe I can completely avoid dependency some day!*

Nazat had similar sentiments regarding her drive to rely on technology rather than depending on other people. She wanted to reduce her mother's responsibility of helping her with all sorts of personal and academic needs. Again, Nazat wanted to be closer to 'normal' than she currently was. Nazat reported that she had already been reluctant to depend entirely on others, and therefore she started using technologies to:

> *show my cousins and other relatives that I don't need their support in my everyday life events. I can perform at least a few things on my own.*

Humayun and Shahdat became motivated to use digital technology due to their need to adjust to new trends and be rid of their 'outdated' dependency on Braille. Shahdat remembered his struggle with there being a lack of reading materials in Braille when he enrolled in the university:

> *Suddenly I found I am studying in a course which had no available study materials in Braille. In the very first class the teacher referred to 6-7 books which only had printed copies in the university library. I could not understand how I could access those printed books. Transforming the books to Braille was*

> *too expensive for me. I realized then, there was no other way than to become*
> *adept/skilful in technologies like audio recording, OCR scanning, screen*
> *readers etc. to meet my needs.*

Humayun reported his drive for using digital technology which enabled his fellow students to become updated about current world issues and fulfil their study requirements more efficiently:

> *I noticed my friends who were using android phones and computers for their*
> *study and living [for them] became more efficient, informative, and skilful. I*
> *was sure the internet made them such smart guys, which I also wanted to be. I*
> *found the use of different technologies made their study easier than mine and*
> *with the internet they got the most updated knowledge. At that time I felt a*
> *strong drive to have similar benefits, which my friends were availing themselves*
> *of through technologies.*

Selim wanted to use different technologies as he perceived that through the internet he could achieve a 'multi-tasking' ability. He mentioned his desire to know many things that could develop different skills for him and qualify him as a competent candidate in his future career. He became motivated to use different digital technologies from this belief that technological skills could overcome his 'limitation' caused by his disability.

6.2.4 The drive to 'succeed'

Apart from the drive to be normal, self-motivation can also be pushed by the drive to succeed. Here I am not referring to wanting to be like others – to have the same sense of power in one's life as they have in theirs – but to wanting to improve oneself simply for the purpose of having a better life.

The drive to succeed is about moving forward in enquiry or action by one's decision to do so. It is often perceived in individuals who decide for themselves that they will do what it takes to achieve what they want to achieve. Some of the participants claimed that their self-engagement – their self-motivation – in learning a range of aspects of digital technologies had enabled them to enrich their technological experiences. This is a clear first step in moving towards achieving one's overall aims in life.

Ahmed reported that he investigated different technical details of equipment to learn how to make more efficient use of devices and applications, and for his enquiries he mostly relied on

the internet. Humayun and Sujata used to solve issues by themselves, at first, and then if they could not find what they were looking for they would ask for other peoples' support. Humayun explained why he did not ask for support initially from other people:

> *When I got the Android phone I thought I should learn to send emails from my phone instead of my computer. I asked one of my friends to tell me how I can do this from my phone. He then described to me the process in his way, which was not clear to understand. Then I thought I would just try it myself, and I was successful. The lesson for me was that I should try to work out all my problems myself first, then if I cannot solve them I should go to other people.*

It was remarkable that Ahmed, Humayun and Sujata all said their method of "trial and error" enabled them to learn new skills and resolve different technological issues. This also reflected their leaning towards self-dependency, and their drive to succeed.

6.2.5 Free and pirated software

All the participants emphasized the enabling role of using a number of free and cracked software programs (where it had been made available to multiple users), which was a very common practice in the country. The students reasoned in the FGD why they relied upon pirated software and how it became one of their main resources for their technology experience:

> *Since we do not get any support from our university or any other organization to buy the original software, we depend on those cracked versions with which we could fulfil our requirements.* (Selim)

They also reported some websites providing free software that also helped them to augment their technological experiences, as all of the participants expressed their inability to pay for original software and applications. Some of them stated their concern that if they had not had the opportunity to use cracked and free software then their technology usage might have been very restricted.

6.2.6 Enablers acting as challenges

The enabling factors mentioned by the students were very helpful, but they also acted as challenges on some occasions. The students reported that sometimes they had unexpected

problems resulting from enabling digital technology experiences, and unexpected challenges. It was interesting to note that from the students' perspectives almost all the enablers mentioned in the above section had a two-fold impact on their technology use. First, the enabler would meet some of their needs. Second, it would indicate further needs to be met, further hurdles to overcome, further challenges to face. Tamanna, for example, became dissatisfied with her knowledge of digital devices and software after experiencing help from more senior students and friends in solving technological issues. She said:

> *Since I always get their support I never sincerely tried to learn how to even install an application on my Android phone. Now I rely on my friends regarding any technological issues. I wish I could be as competent (about technology) as senior students and my friends are!*

Nazat reflected that even though she was happy that her younger brother managed all her technological needs, she would feel more confident if she could learn to decide for herself if she should switch to the *iphone* her relative sent from abroad, or continue to use Android phones. From these statements from Tamanna and Nazat, the concept emerged that support from other people may have been enabling in some regards, but it did not enable them all the time. In fact, it sometimes helped to perpetuate dependencies on others for assistance. Thus, it created the challenge of becoming more self-dependent regarding technologies.

It was evident from the data that organizations working for the welfare of persons with disabilities had positive roles in enabling students with disabilities to use digital technologies by providing devices, software and other supports. However, Iftikhar, for example, was given a large and heavy laptop from an organization which became burdensome for him to carry everywhere. As a result, he rarely brought that laptop outside of his room. He suggested that if he could have selected that laptop himself, then he might have more carefully selected one that was more convenient for him, and therefore which better met his needs. It was also mentioned by other students that the devices procured by those organizations were not the most upgraded laptops. Therefore, others also experienced difficulties using software that required updated device configuration.

As reported in previous chapters, regarding the use of pirated and cracked software, which was common practice in Bangladeshi, the participants stated that occasionally their use of such cracked software inhibited them in regard to updating and obtaining all the features of the software. Humayun stated that if he could have used the original version of JAWS and

therefore had access to all the features which the original version offered, his digital technology usage would have been enhanced.

6.3 Challenges

The participants reported issues that had inhibited them from using, as well as achieving maximum benefit from, digital technologies. Some challenges were still present at the time of data collection for this study. However, they also reported some challenges which had been overcome over the duration of their courses. This section discusses the persistent challenges the participants experienced during their digital technology use.

6.3.1 Limited or unavailable technology resources

The participants expressed their dissatisfaction with the unavailability of necessary software which could enable them far more efficient use of technology. Ahmed, Shahdat and Humayun reported that students with visual impairment could not access any Bengali PDF and image files as there was no screen reader software that could convert OCR documents in the local language. Ahmed reported:

> *I have access to a Bengali online library which has so many Bengali PDF books. But they are of no use to me since my screen reader cannot read Bengali PDF files.*

Shahdat was also disappointed with the e-books available to him as he could not access those for the same reason. As well as this, Shahdat and Humayun reported that they were unable to fill in non-Unicode Bengali online forms, which were not supported by screen readers. Humayun reported his experience with government websites, where most of the important notices were posted in PDF only:

> *I cannot access the notices and examination results published on government websites in PDF because those are not readable yet by screen readers like NVDA. I don't understand why the government is not paying attention to this and circulating all of their notices either in Unicode format or in English also.*

Ahmed spoke to a government official regarding this issue. This official said it was for security purposes that all the documents were published as PDFs only, as the documents contained official signatures of people in authority. Ahmed was not convinced. He assumed

the government offices published PDF notices simply because this was more convenient for them and involved less uploading time.

Although the students now had more opportunity to use digital technology than they had earlier in their lives, they also reported a few limitations regarding software, applications, necessary technological support and advice, stating that these limitations constituted challenges for them. Ahmed highlighted the limitations caused by the lack of compatibility between websites and screen readers, stating: "Some websites are not accessible with our screen readers. I experienced problems in reading out webpage contents, directing from one to another link". He also noted the same problem with web browsers like *Baidu* which sometimes inhibited his screen reader from being able to read out from the screen, and which remained inaccessible in the area of giving commands from keyboards. Humayun reported a similar problem with some antivirus software which was not completely supported by screen readers.

According to Ahmed, his digital technology experience was more limited in areas outside the major cities. He spoke of his own experience when he lived for a while in a district where he had no contact with other users of digital devices. At that time, if he needed any help regarding problems or updates of technologies, he had to go to the capital to resolve the issue or to collect updated technology. He assumed that this situation had not changed substantially at the time of his interview in April 2016.

6.3.2 Non-cooperation of others

Despite the students' acclamation regarding support from people surrounding them, some of the participants also reported non-cooperation from other people. In most cases they expressed their displeasure toward their friends for not delivering the expected support regarding their technology related needs. Iftikhar mentioned his experience with his classmates who sometimes got annoyed with the noise of his screen reader:

> *Occasionally my classmates ask me to stop the screen reader when we work together. They complain that the noise distracts them from work. I then reply to them to do my work in their device or try to use my screen reader without noise. Sometimes they pull back from their objection after experiencing my screen reader which is not familiar to them to operate. Eventually they understand it is not so easy to use technology with 'blind' eyes.*

Iftikhar reported that because of this type of objection from friends, he had to restrict his use of technologies, particularly in the presence of other students around him. He said he felt helpless when he had important needs which involved the use digital devices, but then inhibited himself from using them because of worrying that there would be objections.

Ahmed recounted a similar reluctance to seek help from other people. He experienced their negative perception of his use of digital technologies, stating they would say things like:

> *These things [digital technologies] are not useful for a 'blind' person like you. You cannot handle these. What is the use of a computer to you since you cannot even see?*

Not only this, the non-cooperation was also in the mask of pretence (or lies), as in Humayun's case when he asked one of his friends to download a file for him as he had no internet connection at that time. But that friend said no, and pretended that he did not have internet data to download with. Humayun did not believe this as he noticed the friend was using the internet at that time. Humayun realized his friend was not very sincere about helping him. A similar incident happened with Tamanna when she requested her friend to assist in her assignment, as she had not yet become a competent laptop user. The friend did not help, despite her continuous requests. Tamanna added, "Then I realized how helpless I am without appropriate knowledge of digital technologies". This non-cooperation was not only from her friends, Tamanna also experienced an uncaring and unhelpful attitude from her hostel warden when she wanted to connect broadband internet in her dorm room. The warden's response was: "*What will a blind girl will do with the internet?*" This disapproval caused her to pay for more mobile internet data which was more expensive than a broadband connection. As a result, she became more frugal about using the internet, even for her study.

Selim reported that his family was reluctant to let him use digital technologies as they perceived that frequent use would be detrimental to his studies. He mentioned an incident during his latest visit home, when his mother noticed him using *Duolingo* which he used on a regular basis to learn foreign languages. She complained that Selim might be 'spoiling' himself with his time on the internet, instead of giving appropriate attention to his academic study. Selim described this unwillingness of family members to allow him to use technology frequently as a very common scenario in a lower middle-class family like his, where the family had a misconception regarding the impact of technology on study. Selim detailed:

As my mother is not aware about the positive impacts of these technologies and not updated with the rapidly changing reality of the current world – she still blindly believes that computers could ruin a student by distracting them from academic study.

Due to this, Selim reported very limited online engagement when he stayed at home in vacations.

The participants also reported some unexpected experiences where teachers did not allow them to record class lectures despite knowing their need to do so. Tamanna told of her experience when one of her teachers became annoyed when she approached her to record a class lecture. The teacher responded, "I don't like these! Doing these recordings captivates the soul. These are not right."

From the statements of other participants one thing that seemed apparent was that teachers generally did not know much about the technology use of students with disabilities. Not all the students demanded that every teacher should learn about their software. However, they hoped the teachers would be considerate of their technology needs. Ahmed found that most of his teachers did not intend to identify how they could support him to use technology convenient to him. He reported one incident:

In an in-course exam I could not manage to get a writer (scribe), and I requested to the teacher that they permit me to record my answers orally into my recorder, and to assess me with my recorded answers. He denied my request and said that obtaining the help of a writer/scribe was not his responsibility. He said it was my responsibility, and that if I failed to get a writer, then it was no responsibility of his.

6.3.3 Financial restrictions

Since most of the students were from middle or lower middle-class families and reported that they depended mainly on different kinds of stipends from the university, as well as from other organizations, for their study and living costs, financial issues had been a significant challenge for them when it came to using technology. It was evident from Utpal and some other participants that, their major technological uses involved online activities which required internet connection. Most of the students arranged unlimited broadband internet connection in their dorm room by sharing the monthly internet costs with other roommates.

Although the university provided free *Wi-Fi* in some limited spots inside dormitories and other places on the campus, the participants reported that this facility had been useless to them due to its slow speed, as well as the reluctance of the students with visual impairments to use screen readers in public places due to possible annoyance caused by the noise of screen readers. Beside this, they did not feel secure in taking their laptop outside of their room or classes. Primarily for these reasons, students with visual impairments did not benefit from the free university *Wi-Fi*. Consequently, they relied only on their self-funded shared broadband in their rooms. They reported spending a good amount of their pocket money for their internet use as Android mobile data was comparatively more expensive than the broadband. However, as well as this, such mobile data had a limited expiry time which constituted another problem for them. As Iftikhar detailed:

> *When I need to use mobile data, I must be parsimonious as to the price for each*
> *MB to ensure it is not too expensive for me. Besides, the data has very limited*
> *time within which I need to use it all; otherwise I shall lose the rest of the data I*
> *purchased.*

He also shared his very recent experience regarding the explanatory statement of this present research which was sent to him via email. Iftikhar mentioned he could not access that email due to his insufficient internet data allowance. Tamanna expressed her family's incapability to provide extra financial support money for purchasing mobile data, stating that this affected her access to the internet for important information related to her study:

> *I can remember an incident when I needed to have specific information*
> *regarding Jean Piaget. I searched in Google from my Android but unfortunately*
> *my data ran out at that very moment. I tried using the university Wi-Fi but it*
> *was very slow to download, even directly from the Google site. Then I gave up.*

Tamanna also mentioned her inability to obtain movies and video clips referred to by a course teacher – this was because downloading videos and using mobile data required an excessive financial cost. Selim had another problem. He also could not afford the internet and his family was unwilling to allow him to use the family computer often. He said:

> *My family has limited ability to support my expenses regarding living and*
> *studying in the university. I cannot ask them to give me more money for buying*
> *internet data, not only because of their financial inability but also because of*
> *their restrictive perceptions of the internet.*

Beside the issue of the high price of internet usage, Humayun and Sagir mentioned other inhibitors related to the quality and procurement of devices. Humayun's Android phone had a limited RAM capacity of less than one Gigabyte. He felt that if he could update to a phone with more RAM his digital activity would be more efficient and faster. Due to his financial limitations, he could not update his device. Sagir reported he had been gradually losing his skills due to lack of a personal computer which his family could not afford to buy him.

6.3.4 Other challenges

Iftikhar and Selim highlighted that their digital technology activities required extra time and effort compared to the time required by non-disabled users. Iftikhar complained:

> *When I use the screen reader I need to listen to the screen reader again and again to understand properly what a sighted person can easily see with their eyes. They require less time than me to complete any digital activity.*

Selim was dissatisfied with the excessive time required for any digital activity use due to his paralysed right hand. He remained unable to perform any digital activity which needed both hands. He compared his typing speed with his other friends, "I need almost a whole day to type any assignment which a non-disabled friend could complete in 2 hours". Tamanna had a different kind of problem – she reported that she would experience headaches and discomfort in her ears if she used headphones for a long period of time. But using the screen reader without headphones would annoy her room mates.

The participants shared a few other challenges they experienced with using technology, most of which they found ways to overcome with time. Initial hesitation in using devices had been very common for all of them. Most of the students with visual impairment shared their first incidents with screen readers as the most miserable part of their digital experience. Humayun could not receive any phone calls during his first day using an Android phone as he did not know how to receive a call on the screen reader, as it required swiping with two fingers. Using a mobile phone also frustrated him. Iftikhar had problems understanding the voice of the screen reader, as it spoke very fast. He reported:

> *Before I started to use Talkback I used to listen to other 'blind' students' screen readers and wondered if I could follow this unclear and fast voice if I use those! At that time it was not easy for me to understand the speech of screen readers.*

Sujata also reported her fear of using her laptop in the very beginning as she was concerned that she might damage the laptop due to her ignorance regarding 'safe' use. Because of this same fear she did not use her new Android for two weeks. Although they were at the beginning of their technology exploration/experience these hesitations challenged the participants. They dealt with these challenges by regular use and self-exploration of different aspects of digital technologies. Iftikhar rightly commented:

> *It becomes very easy to use any technological thing if you own it and have the chance to use it regularly. Regular use reduces the fear of technology.*

6.4 Discussion

In this chapter, as the data illustrated, technology was perceived as supporting the learning process of the disabled students overall, mirroring findings from students in other educational contexts by Cranmer (2018). However, while technology assists disabled students to improve their learning as well as socialization process, they often face many challenges to access and to utilize technological tools at the first place. That said, this chapter found that the 'family support' was one of the most crucial enablers for the students with disabilities. As all of the respondents had family support, the importance of which has been acknowledged by the students, it is reasonable to argue that, without family support it would be difficult or impossible for disabled students to access HE in general. Similar findings can be observed in many scholarly papers, such as Morosanu et al. (2010). Family support often came as either financial support (enabling purchases) or through making technological equipment (including 'how to use' this) available. This support was extended into purchasing software, providing internet connectivity, paying training program fees and maintenance, informing the students of relevant new products, lending them their equipment, and helping them with technology-related issues. The students also reported that their families were keen to help them by troubleshooting any issue that the students could not solve by themselves, as well as lending their own device if their children/siblings did not have any.

Friends were also said to be very helpful, in all areas ranging from lending phones to recording lectures (Tamanna), and even providing inspiration (Humayun). Iftikar made the important comment that friends try to help those with disabilities to be self-reliant because otherwise, the disabled students would have a reliance on them which would take even more of their time. Friends had been one of the major supply chains of software and applications,

and information and technical advice required by students with disabilities, with senior students being highly praised by the students. Though Soria and Stebleton (2012) depicted the family as the primary sources for support, Keane (2011) explained how similar socioeconomic background can dictate students' behaviour in HE settings, which might explain the evolution of this informal support system. However, Philanthropic organizations and other NGOs also play important roles in this context. In many cases, they provided training that was simply not available anywhere else. The students wanted to be 'normal', and they wanted to be self-reliant. In acknowledging that they needed help and assistance from many quarters, they also acknowledged that they were driven to be 'normal' and to rely more on themselves. It wasn't enough to have equipment that they could use, many of the students also wanted to develop the knowledge to understand that equipment to the extent that they could solve problems themselves as they arise.

Free and pirated software was also important. This was not just to save money, but because much of the software that the students needed was just not available by other means. Thus there were many enablers that helped the students in their studies. However, there were also challenges that confronted the students in the midst of these enablers. This related to a number of areas of their study life including being unable to update 'cracked' software or to have access to all their features, receiving laptops as gifts that were too heavy to manage, and reliance on the help of others – this was a reliance that they wanted to break away from.

The challenges extended to a need for technology resources that were simply not readily available. Other challenges listed in the 'Challenges' section of this chapter included the non-cooperation of others. As the participants reported, many people – friends, family members and even teachers – were helpful. Sometimes, however, it was reported that people whom the students expected to be helpful, were not. This was the case with noisy technical equipment, for example, where 'friends' insisted that the equipment not be used. It was also the case in other areas such as friends refusing to share internet data. In addition, the lack of institutionalized support systems was the biggest latent challenge of all.

Finally, a lack of income was a significant challenge for the students. This caused many issues such as an inability to access sufficient internet data allowance, alongside further issues such as the need for more time (in comparison with non-disabled students) to complete study tasks because of their disabilities.

6.5 Conclusion

This chapter has detailed the wide range of enablers assisting those students interviewed. These enablers ranged from support from family, friends and philanthropic organizations, to one's own self-motivation and to the use of free and pirated software. The chapter has also detailed the challenges found in the findings of this research. These challenges were numerous and include limited or unavailable technology resources, the non-cooperation of others and financial issues.

The following chapter presents the findings related to the third research question which is concerned with the extent to which students' experiences of digital technology use are shaped by the 'institutional' provision of technology resourcing by university authorities as well as the non-institutional provisions.

Chapter Seven: The 'institutional' and non-institutional provision of technology resourcing

7.1 Introduction

The chapter considers the provision of technological access and support to the students in the study. It deals with the findings in this research which are related to the third research question:

> 3. How are students' experiences of digital technology use shaped by the 'institutional' provision of technology resourcing by university authorities? What other forms of technology provision are also shaping students' experiences?

By Institutional terms, at least, University authorities play a key role in supporting students' technology experiences. This was enacted through the provision of technology hardware, software, a support service system, as well as skilled technical support staff. In addition to these institutional provisions, students in the study reported that they also experienced support from philanthropic organizations, as well as their own informal support systems with peers with disabilities. The following chapter closely explores the nature of these various networks of technology provision and support.

When describing the institutional forms of provision of support, the data from the staff interviews, student participants' reported experiences and the researcher's own knowledge were shaped into vignettes (in 7.2 and 7.3) by the researcher so there is a more comprehensive and coherent picture of the facility. The subject of each vignette is then further considered critically in light of the perceptions of students and staff.

7.2 University provision

According to many members of the staff who were interviewed, the University had initiated several forms of technology provision, all over the University, for all students. As the Disability Officer described:

> *The University is providing a variety of technological facilities for every student. For example, most of the departments and institutes have individual computer laboratories for ICT courses. In addition, there is a 'Cyber Center' in the Teacher Student Center (TSC) and in the main library where all students can browse the internet. Some areas of the University are covered by free Wi-Fi*

However, many students with disabilities perceived those provisions and support services to be most beneficial in practice for students without disabilities. As such, it was perceived that the specific needs, when using technology, of the students with disabilities were being ignored by the University. First, this section considers the experiences of students with disabilities of the technological services they were receiving from the University, alongside their concerns about these supports. Along with this, the interview data from senior students, support staff and faculty are also unpacked to explore the lived experience, including the positive perceptions as well as the frustration of students with disabilities regarding University technology support.

7.2.1 Range of support services

Along with the common facilities for all students, it was reported by the staff interviewed that special considerations were given to the needs of students with disabilities.

<u>Vignette 1</u>

The Resource Center for students with visual impairment

One of the tangible aspects of the University's provision for disabled students was the 'Resource Center for Students with Visual Impairment'. This was constructed in 2007 with the financial and technical support of Sightsavers– a UK-based non-government organization that funds initiatives around the world. According to University staff, Sightsavers had approached the University to express an interest in establishing a Resource Center with facilities for students with visual impairment studying at the University. Given their previous difficulty in establishing library facilities for visually impaired students, the University authorities were happy to accept the offer, and designated a small separate space behind the existing library building.

Sightsavers provided an initial set-up of what were deemed to be necessary stationery resources, course-related Braille converted books, as well as analogue devices such as tape recorders and Perkins Braillers. An interviewee who had worked in the center from its inception recalled that students in 2007 were mostly dependent on analogue rather than digital materials. That said, the sponsors anticipated a gradual move toward digitally-

based learning, and so had provided a digital recorder which students could use to record reading material/books/notes, as well as listen back to self-made recordings on a computer. In addition, this center had internet-enabled desktop computers installed with special software, (such as JAWS) for students with visual impairment.

Ten years later, the resourcing of the center remained generally unchanged. There was a predominance of tape recorders and Braille machines as well as the original digital recording devices. The center had a number of desktop computers with cracked/pirated versions of the specialized software. Staff were not sure why original versions of the software had not been purchased, but even some of the cracked versions were from 2007. In all, there was a sense that the facilities and resources had not been updated significantly over the past 10 years.

The reliance on old, cracked software was acknowledged as compromising what students were able to achieve with the digital resources. For example, some participants reported losing data due to the limited features of pirated software, experiencing regular shut-downs and interruptions, and also suffering from computer viruses. Students saw this as a sign of neglect and general ignorance of their needs on the part of the University. In contrast, the Resource Center staff interviewed pointed to students' general lack of engagement with the center as underpinning the University's unwillingness to replenish and upgrade its facilities:

> *Most of the students with disabilities do not come frequently to the center to use computers and the internet. A few students come here only for collecting special Braille paper or to do recordings in their own mobile device as the place is quiet. I do not know why they do not come here more to work on the computer. Maybe all of them have their own device. I heard almost all of the students got laptop or smart phone from other voluntary organizations which made them self-sufficient. Since they do not come for using computer very often, we cannot ask the University to buy expensive original software and keep it un-used.*

This lack of maintenance notwithstanding, the center continued to be staffed by five dedicated support workers – including three persons with visual impairment recruited specifically for providing technology assistance to students with visual impairments. As one staff member put it, the University intentionally appointed staff like him in the expectation that they would be able to understand the needs, learning process, struggles of students with visual impairment since they also experienced a similar 'life' without vision.

Yet the students reported contrasting experiences of this support. While some welcomed the ease with which staff would assist in typing in a Braille machine or find Braille converted books in the center, their support with digital technologies was less consistent. It was suggested by students that since most of the staff had been appointed at the beginning of the center, they had little incentive to keep abreast of subsequent technology developments – preferring to continue making use of the technologies that were prevalent ten years' previously. Indeed, one staff member conceded that developing new skills in online tools and techniques would result in a considerable amount of additional work given that it would result in being the only member of staff that students could consult for advice: *"It is the harsh reality that most of us here do not have any technological skill at all, and they are not interested either to learn. This resulted in unwillingness for taking responsibility to support students"*.

Some findings regarding the Resource Center outlined in Vignette 1 require intensive consideration. Providing a separate, isolated space for students with visual impairment was perceived by many of the case study students as causing exclusion from mainstream social activities. They argued, that if the center were set up in the main library building or in some other common space where students without disabilities also come for studying/using technology, there would be an opportunity for social inclusion/ social relationships for students with visual impairment.

The Resource Center staff member's reasoning for the University's unwillingness to upgrade the facilities expressed a very different perception of responsibility for facilitating learning than does the social model of disability. This model advocates that responsibility for problems due to impairment should be taken by society, but here the staff member was emphasizing that it was the students' responsibility for not coming to the center very often. Placing responsibility on an individual person relates to the medical model in which the individual is always responsible for his/her situation; society holds no collective responsibility for a person's disability. From his comment it was evident that staff were seeing this issue as a student's personal lack of interest/willingness. However, other reasons were likely prompted by the Resource Center environment (e.g., the reluctance of female students to go there, as the Center is located in an isolated place behind the library) and other issues that hindered the students.

Although the staff members' role in assisting the students was criticized by most of the student interviewees, from the vignette it seems likely that the University was aware of the

need to address the issue of empowering people with disabilities by appointing staff with visual impairments to support students with similar disabilities. This appointment created a double empowering opportunity for the staff and students. Jobs in the University empowered these staff with institutional entitlement. With this, the staff could empower the students as well, providing support and knowledge for becoming more autonomous and avoid "relying on charity or goodwill" (Shakespeare & Watson, 2001, p. 5)

Aside from these provisions for students with visual impairment, students with physical disabilities and voice impairments contended that the University was not providing any significant technology support for those with other disabilities. The University had nearly 40 students with physical disabilities and some un-recognized students with disabilities (in this study a student with speech impairment participated who was not officially – by institutional provisions – recognized as a student with disability). It was felt that, the University was ignorant/unaware of the particular technological needs of those students with physical disabilities and other types of disabilities.

7.2.2 Positive experiences

Most of the participants acknowledged the University's role in initiating particular technological support services for them. Despite major criticism about the Resource Center and the staff working there, some of the participants admitted that, at least, they had a place in the whole University where they could get the minimum support they needed regarding technology. Humayun positively pointed to the role of this Resource Center to students who might be just beginning to use computers and/or to a student who did not have his/her own device and internet at home. He argued, if a student lacked devices and software, s/he could visit the center to minimize the need, temporarily. The interviewees again argued, whatever the Resource Center had and what service it could provide, the it enabled students with disabilities to demonstrate their skills on digital technology, which they considered as a means to be treated 'normal' (in their term) among peers.

Iftikhar, a mature student with late blindness reported one positive impact of the Resource Center for enabling students with visual impairment to demonstrate skills on digital technology which he considered a significant way to be seen as 'normal' to peers. Iftikhar assumed that his exposure to digital technology in the Resource Center had changed the perception of his sighted friends about his ability. He explained

> *the Resource Center gives us a status, particularly to our peers without*
> *disabilities around the University who only have sympathy for our disabled*
> *condition. But, when they saw I work on computers or browse the internet in the*
> *center despite my blindness, they started to think differently about my abilities. I*
> *would say, for good or worse, whatever this center could provide us - it also*
> *helps us to gain dignity from other people.*

Iftikhar's perception corresponds with other interviewees perceiving their skills on technology as an important mediator to express themselves as 'normal' human beings. This also indicated their understanding of a change in the relationship with peers, which they did not notice prior to their exposure to technology. It is significant to observe that some participants perceived a normalization of interaction (see also Davis, 1961, cited in Low, 1996) had commenced between them and their sighted peers due to their progression with digital technology skills.

Iftekhar's comment also signifies his desire to obtain a similar 'normal student identity' to that of students without disability at the campus. It was clear from his reporting that he was not necessarily treated by peers with the same level of status, position, and dignity as were fellow students. This absence of equal status, and experience of frequent adjustment to a disabling environment in all spheres of life, possibly culminated in a stronger desire in him to become a 'normal' (according to his term) student. This desire has been reported as an outcome of "oppression by a societal view of normality" (Llewellyn & Hogan, 2000, p. 159) where society demands people with disabilities to act/function like others.

Although there were no institutional regulations for the teachers supporting the technological needs of students, a few incidents were prominent in which some participants experienced their course teachers supporting them using technology. For example, Shahdat acknowledged that some of his course teachers provided him with soft copies of the power point slides that they showed on a projector during the classes. According to Shahdat, those teachers understood that if he were provided with them, he would be able read the soft copies (that is, the PowerPoint slides, reading materials) using his screen readers. Shahdat reasoned that most of the time his sighted classmates did not require any soft copies as they could follow hard copy books or other reading materials. It would become challenging for him if the teachers did not provide him with soft copies.

Nazat also experienced positive support from her course teachers when she requested them to email her the course materials which would enable her to read using screen reader software.

She reported, that course teachers did not necessarily provide soft materials to other students, but in her case, upon her request, they supplied the materials through email or *Dropbox*. Some teachers were cooperative, allowing students with visual impairments to record the class lecture, and were considerate of their needs by delivering speech at a moderate pace. Tamanna gave several incidences of her teachers reminding her to put the recorder on the teachers' table before they started lecturing.

It was interesting to find similarities with other studies (Bourke, Strehorn, & Silver, 2000; Murray, Wren, & Keys, 2008) with Shahdat, Nazat, and Tamanna reporting that, comparatively, the recently appointed faculty members were keener to assist them according to their particular requirements. It may be reasoned that the junior faculty members were more knowledgeable about digital technologies in comparison to their counterparts from the previous generation. Therefore, they generally had more exposure to information regarding inclusive provision for the full participation of persons with disabilities in the society.

However, some of the participants, including Tamanna, also reported some senior teachers' reluctance to allow the recording of the lectures, considering this is a sensitive knowledge ownership issue, despite understanding these students' requirement to listen to lectures several times later on for making notes. Therefore, considering the interview data regarding teacher support, some contrasting faculty attitudes were evident. It is most likely that these stemmed from a lack of explicit rules of business, in the University policy, for the faculty members to exhibit similar approaches to facilitating the learning of those with difference.

7.2.3 Frustrations/complaints

The following section will describe some tensions and dissatisfactions of the participants regarding the University's technology provisions.

7.2.3.1 Mismatch between University initiatives and students' expectations

It was expected by the participants that the University would consult with students regarding their individual needs before setting up support services for digital technology. However, from the interview data, there was no evidence that this 'ideal' approach had been carried out by the University authority. Therefore, all of the participants expressed their dissatisfaction about the University initiatives to provide students with a technology friendly campus. They sharply commented – somewhat sharply – that the University had never initiated any

noteworthy technological support such as providing the students with digital devices and software or organizing any training program that could enrich their digital activities.

Vignette 2

Tamanna, a third-year student reported in her first interview in 2016 that her University residential hall authority refused to permit internet connection in her room asking "*what will a blind girl do with internet*?". Although she had other sighted roommates in her shared room, the hall authority was reluctant to give Tamanna specific permission for internet connection as the named applicant for the permission. Tamanna expressed her feeling at that time reflecting the importance of faculty respect to students' perceptions of status:

> *It was really disgraceful to me as a person, not only as a 'blind'. I was really shocked to experience such a disrespectful comment from a person who holds an academic position in the University.*

One year later she reported in the second interview that eventually her room had got internet connection after applying through a female roommate without a disability. Tamanna felt that despite their claim to create a disability friendly digital campus, nothing had changed in the perceptions among University authorities. Tamanna argued that the hall authority should have prioritized her application. Instead, she continued to feel set apart from peers without disability and 'excluded' from the University support system; this increased her perception of feeling stigmatized. Thus while she had internet connected accommodation, Tamanna still perceived the University provision as exclusionary.

The perception of the particular hall staff in Vignette 2, regarding internet use by a female student with visual impairment is likely to have originated from the perspective of the social construction of disability, where society creates a particular mind-set among other people regarding the capability of people with disabilities. This mind-set differs according to social values, norms, and culture. It is interesting to observe that no male student with disability mentioned any difficulties in obtaining permission from a male students' residential hall authority. This indicates that, in effect, Tamanna had double disability firstly as a female, and secondly as a person with visual impairment. Given the social and cultural context in Bangladesh, it can be said that the issue of not providing Tamanna with internet access originated from a particular social mind-set regarding women with a disability.

Tamanna felt further marginalized by her sighted roommates' perception that they were not being allowed an internet connection because of her. Consequently, she was at risk of detachment from her peers, caused by a lack of institutional intention to foster friendships and social networks which benefit students by minimizing stressful experiences in higher education and avoiding early departures (Thomas, 2002) or isolation. As mentioned in Chapter Six (Enablers and Challenges), Iftikhar reported that some of his classmates had complained about the noise of his screen readers, whereas noises from other students' loud conversation were ignored. He perceived this as intolerance of the special needs of fellow students. Considering Iftikhar and Tamanna's experiences, there seemed to be a lack of a learning system designed for all students in the University to feel 'connected', despite all sorts of individual differences and needs.

Limited or unequal access to the common University facilities can lead students with disabilities to a stigmatizing situation which requires them to invest more time to negotiate their 'disabled' identities in the campus environment (Low, 1996). This also happened with Tamanna when she realized there was an excluding environment that was applicable only for students with disabilities, one where she had no way to refuse or conceal her disability. Therefore, a tension was evident in her because of the need to deal with the uncompromising environment in the University.

Most of the participants with visual impairment reported that the Resource Center had few significant contributions to make to their technology experience. Humayun highlighted staff members' inefficiency regarding the use and maintenance of technology as one of the main reasons behind it. Ahmed mentioned one incident in which, due to the lack of staff skill, an expensive Braille printing machine was becoming useless as no one knew how to fix it. He was surprised by their lack of skill and knowledge regarding computer operations. In addition, Shahdat found the staff were uncooperative when students sought their support:

> *At the beginning [of my study in this University], I had become frustrated for the reason that, all the references provided by the teachers were hard copy books. At that time, I did not have any scanner for scanning the books. Firstly, I took a book in there just to get that scanned. So, they returned my book after I had waited for one and a half months, but the work was not done. Just then, I bought a scanner on the same day. They had an excuse. I was told that, the scanning could not be done, as there was no anti-virus installed on the computer. I understand that the issue of the anti-virus should arise when I am*

about to get the scanned copy delivered on a pendrive. That cannot be an excuse while it comes to scan the book using the scanner. It means that, because of laziness, they did not do it. They have been recruited in there to do these kinds of favours. I can say that they are not responsible towards their assigned tasks.

Dissatisfaction about staff members' support at the Resource Center was also mentioned by other participants who believed the staff were unwilling to learn anything because, if any of them learned something, that particular staff member would incur the responsibility to teach the students. They might not be interested in taking this responsibility either. Some of the students argued that these staff members did not seem to be accountable to the University authority for supporting the students. The participants emphasized the inadequate resources, particularly the apathetic conduct of staff in the Center, which hindered the students' opportunity to maximize control over their disabling condition. Sultan, one senior student interviewed, reasoned that because of this kind of noncooperation most of the students lost the motivation to go to the Center. Consequently, whatever facilities the University had provided for these students remained unproductive and ineffective. Thus, the Center remained unable to support the students' autonomy which, ideally, is considered the main aim of any service for people with disabilities (Jordan & Bryan, 2001).

One of the Resource Center staff interviewed reported an almost similar view, where he found lack of interest among other staff of the center regarding technology. He commented:

Some of us [staff] are disinterested in technology, therefore, they cannot fulfil students' technological needs. Being the single staff member to have technological skills I sometimes become burdened as all of the students want to consult me. We all got jobs in the University as persons with disabilities to support students but, unfortunately, most of us are still not competent and responsible enough for the role.

Considering this, it was likely that staff limited their assigned responsibilities due to their inefficiency on digital technology, procrastination in functioning, and inappropriate University monitoring.

Iftikhar agreed that the University might not provide devices for all students, however, they could provide appropriate places for them to work on their own computers. He argued that students without disabilities could use computers at any open public place. However, some of the students with visual impairments were reluctant to use their screen readers in public

places due to the noise arising as they listened to their screen readers, and issues related to their unwillingness to disclose their disability. He expressed dissatisfaction that the Resource Center was not spacious enough to accommodate even ten students, with their own devices, even though there were around 72 students with visual impairment in the University.

Dissatisfaction about the space of the Resource Center was also reported by the Disability Officer of the University:

> *Actually this is [the Resource Center] an 'office-come-reader' section. While working with screen reader software on the computer, it continuously speaks. As a result the person next to the computer has difficulty to properly listen to his/her own screen reader. Along with this, while typing in the Braille machine it creates a sound. Moreover, the staff need to talk for official purposes. As a result, students who come here to record something face difficulty due to these excessive noises.*

Apart from students with visual impairments, the students with physical disabilities also expressed their concern regarding the lack of any particular technological support service and provision from the University. Selim, Utpal, and Sagar had impaired limbs that sometimes required special consideration for using digital devices. Due to the paralysis of a hand and leg, Utpal had difficulty in typing on the keyboard, holding and operating mobile devices in one hand and sitting on fixed-height chairs at the University's computer workstations. He reported that he never received any support from the University for minimizing his problems with digital technology that accorded with the concept of 'reasonable adjustment'. He could go to his department's computer laboratory to work on computers, but those were not customized according to his requirement. Given this, he perceived inequity in the University provision for students with other disabilities which he considered a violation of the '*Person with Disabilities Rights and Protection Act, 2013*':

> *I am not complaining why students with visual impairments got particular facilities like the Resource Center; I am convinced that as a person with a disability it is their right to get such 'reasonable adjustment' from the educational institution. However, according to the Act, the University is also responsible for providing particular support for students with other kinds of impairment even though we are few in number. The lack of any distinctive support service for students like me indicates the University's ignorance towards our equal rights.*

The Disability Officer also conceded that some insufficiency remained in the levels/types of support provided for all kinds students as he considered the University authority sometimes became burdened providing services for almost thirty-five thousand full-time students without disabilities. However, he claimed the authority had sincerity to support students with disabilities although they represented less than one percent of the total student size. He was rather optimistic in reporting that, initially, the University had opened the '*door of opportunity'* to students with visual impairments by establishing the Resource Center. He believed that, gradually, the University would expand the facilities to other students with disabilities. From this perception, a sense of benevolence was evident. He was seeing the Resource Center as an administrative solution to the needs of students with disabilities, not as their civil rights/rights of equal opportunity.

The ICT teacher interviewed was dissatisfied with the unequal practice existing in the University where he found the University had been focusing mainly on students without disabilities who were the majority. He observed that nearly all of the technological initiatives undertaken targeted the demands of that majority group. He mentioned his experience regarding the difference of facilities provided in the ICT practical classes:

> *In my courses, students are required to attend practical classes. In my institute, we have more than 30 computers in the laboratory. All of those are installed with all the necessary software for students who do not have any vision problem. Despite my awareness about the requirement for some specific software and/or customized devices or tools for students with disabilities, I am not provided with such technological support equipment/materials by the University.*

Considering the staff and the faculty perceptions stated above, it was likely that, as a common social practice, the University was prioritizing the demands/needs of the majority of the students, providing them with a more beneficial environment than that for students with disabilities. This was resulting in students with disabilities having comparatively less access to the required digital technology support they needed to study effectively. This practice was uncontested by the students, as most of the students with disabilities in the University came from middle or lower-middle class families in which there is a tendency for their concerns to remain unspoken and undisclosed due to a fear of being labelled and victimized. They do not necessarily come forward to argue with the authorities if they are ignored or feel they are less prioritized.

7.2.3.2 Lack of consultation

The students were dissatisfied that they were not consulted about their technology needs by University authorities prior to such support being provided. Ahmed said the University authority did not inquire about the needs of a student with a disability in any phase of their studentship. Nazat commented that, despite completing almost half of her four-year bachelor degree she had never been asked by the University about her specific technological requirements. Some of the other participants reported instances which highlight the consequence of providing unnecessary equipment without asking about the students' concerns. For example, Humayun was unhappy about the expensive Braille printing machine at the Resource Center procured by the authority from a third-party organization. He argued that most of the students did not depend on the Braille system anymore due to its complex nature and had become drawn to digital technologies like smart phones, screen reader software and other technologies. In such circumstances, if the authority asked them about their needs, the students might suggest the procurement of more computers for the Resource Center or the provision of training programs on digital technologies. This student reported he had the experience of being consulted by other philanthropic organizations. Consequently, he transferred the expectation that the needs of students with disabilities should be at least acknowledged or that students would be asked about what they needed regarding technology. He contended that this clearly was not happening at the University.

Similar sentiments were expressed by Sagar, a student with paralysis in his leg. Due to financial insolvency, he could not buy sufficient internet data for his mobile phone. He reported that when he ran out of data he had to go near to his residential hall office to use the free internet since the range was limited around the office. For this he needed to go down the stairs from his room and walk a long way to reach the office. With the problem in his leg, it was quite difficult. He acknowledged that it was a regular mobility hazard for him to move around the campus with his paralysed leg and this issue was something that had been related to every single issue in his life. However, he argued that the University could provide at least internet access to all students, regardless of space, distance and time since he believed no student should walk far or climb stairs to access internet in this era of technology explosion. He also highlighted his struggle to access free internet at his residential hall:

> *Sometimes it feels like I am 'doubly deprived'. All the residents at this hall*
> *experience disadvantage in accessing the Wi-Fi network from their rooms, and*
> *so do I. But they can move nearer to the range with their devices to overcome*

> *this disadvantaged situation. It is really difficult for me to do this. This makes*
> *me feel 'doubly deprived'.*

It is evident that dissatisfaction prevailed among the students with disabilities due to the incompatibility between their needs, and the available University provision. This incompatibility is likely to have arisen from a social practice where people without a disability usually shape and determine what should be appropriate for a person with a disability. Clearly, determining the needs of people with disabilities through a 'non-disabled' lens has the potential to produce inappropriate support/provision. The University authority appointed three staff with visual impairment in the Resource Center, claiming they could provide effective support for students with disabilities. Nevertheless, during the interviews it was revealed that these staff did not possess the authority or knowledge to determine or contribute to the University provision regarding technology for students with disabilities. For instance, when one of the staff members was interviewed, he explained that the Resource Center staff did not have the authority to make decisions about the facilities/equipment needed in the Center. Rather, they could only propose facility improvements/updates; approval came from a higher University authority.

7.2.3.3 Similar mainstream frustration about university facilities

Although, the participants acknowledged that the University had provided some general technological facilities for all types of student, some of the participants argued that, most of the time, these support services were not accessible to them. For instance, regarding the free Wi-Fi spots, Humayun expressed his disappointment, commenting,

> *" but that cannot be of support. They get a huge load. For example, if a 512*
> *Kbps connection gets shared by 100 people, they cannot even browse Facebook,*
> *let alone other tasks. That is, we've got internet, but it is really insufficient.*
> *They exist only by name, not in their deeds".*

This frustration regarding insufficient internet speed seems similar to that of their peers without disabilities who probably experienced the impact of slow speed internet. It perhaps indicates thata university in developing countries where resources are limited, may find the provision of services/support, according to individual needs, impractical.

7.2.3.4 Contradiction between being 'normal' and seeking special support

All of the interviewees were very keen to report that, almost all of the University facilities regarding technology were not specifically targeted for students with disabilities. They provided several instances where the support was unable to match their specific pattern of use of digital technologies. Most of the participants complained about practical sessions of the Information and Communication Technology (ICT) courses in computer laboratories. The students reported none of these laboratories were equipped with customized devices and software which considered the special requirements of students with disabilities, particularly for students with visual impairments. Ahmed reported that students with visual impairments attended the sessions as academically required. Nonetheless, supportive software like JAWS or NVDA had not been installed in any computer. As a result, either they sat at the back of the classroom, ineffectively, or they needed to take their own devices along. Nevertheless, taking their own devices to classes did not help them much as neither the ICT teacher nor any other laboratory staff had the knowledge about how to teach the topics, using the specific software for students with visually impairments.

Humayun expressed his concern about his inability to learn SPSS and web programming as suitable software was not installed in the laboratory computers. Moreover, his course teacher did not know how to teach him statistical packages using JAWS. Therefore, he could not learn those topics properly. To overcome this situation, Humayun installed JAWS twice in one of his institute's laboratory computers with the permission of the teacher but, one day when he went to work on that computer, he could not find JAWS. Ahmed, experiencing the same incident, assumed someone might have removed the software from the computer, considering it to be unnecessary for sighted students. Given this experience, both of them argued for a few computers in the University computer laboratories to be reserved for students with visual impairments, loaded with relevant software like JAWS, NVDA as well as additional software packages relevant to the needs of students with other types of disabilities.

In many parts of Iftikhar's interview it was evident that, like most of the students with disabilities, he possessed a 'student with a disability' identity in relation to obtaining specific support services in the campus such as special devices and software, and the reservation of a fixed computer in the computer laboratories. In addition, there were many occasions when Iftikhar was able to demonstrate that he was equally as capable, skilled and knowledgeable as other students. In other words, Iftiklar's disability was only one part of his identity as an

individual. Nevertheless, Iftikhar was concerned that by openly giving expression to these other abilities, he would be expected to compete with people without disabilities despite his disabling condition. It is interesting that the desire to be perceived as 'normal' was sidelined when Iftikhar was required to negotiate his two contrasting identities.

This contradiction is reflected in Chapter Five, (Students' digital technology access and uses), in which most of the interviewees reported themselves as 'normal' users of technology. Nonetheless, in terms of the University's provision/support for their technology experience, these students argued that they were not provided with the specific support needed for them to use digital technology effectively, thus hindering their academic progress. One possible reason for this contradiction could be that, these students were aware of their impairment, therefore, a 'reconstruction of normality' (Watson, 2002, p. 519) was necessary for them while re-shaping their self-identity as a 'normal' student.

7.3 The support of philanthropic organizations

It was evident from the interviews with the case study participants that their digital technology experiences had been supported, and sometimes shaped, by some external organizations that worked for people with disabilities across the country. Most of the students interviewed reported the organizations' support services were helpful for their technology experiences. They acknowledged that these organizations provided a range of services such as procuring digital devices like laptops and smart phones, allocating funds for buying devices of their own, providing disability specific software, organizing computer training programs, offering free information, and troubleshooting technological problems. Some students, including Shahdat, Tamanna and Iftikhar, were given their first computers by these organizations, which they marked as one of the most important factors in improving their technology use. Besides, some participants admitted that they learnt operating digital devices such as computers, smart phones with special software from the training programs of those philanthropic organizations. Tamanna asserted that the skills she learnt from the training she received from such an organization enabled her to overcome most of her blindness-related learning barriers. She was confident her acquired skills in digital technologies would make her employable, as she believed that employment opportunities depend largely on an individual's technological skills.

However, Ahmed was not very enthusiastic regarding the impact of the training services as he considered the training should provide primary concepts of computers. He argued that, due to the short time frame of the training programs, it was not possible for any student with visual impairment to acquire excellence in technology skills. Rather, he reported how he developed technology skills through his willingness to learn or to get in-touch with technology. He further argued, no training could teach or make someone skilled in technology, unless the person had the enthusiasm and engaged in the effort to learn new technologies.

From the interviews with staff from two such philanthropic organizations, it was evident that these organizations had programs/resources for supporting people with disabilities mainly in the areas of their living, education, employment, and empowerment in society. The case study participants also reported that these two organizations' support services satisfied their individual needs for overcoming the barriers of their disabilities:

> *Iftikhar: I am involved with 2-3 organizations including PDF and VIPS. Before I enrolled at the University, I lacked communication skills. I could not engage with any network of people due to my inadequate skills to mix with others. I also had a problem with talking to other people. While talking my words got stuck or my body would start trembling – it happened due to my lack of confidence for conversing with a stranger or a lesser-known person. I have overcome these problems since I became involved with these organizations. They gave me opportunity for frequent interaction with other students.*

The following two vignettes briefly introduce these two particular organizations, including their scope and major support provisions for persons with disabilities. Later in this section, these two organizations' specific support services for technology, and the perceived impact of these provisions are discussed based on the data generated from the staff of these two organizations.

Vignette 3

Visually Impaired Peoples' Society (VIPS)

The 'Visually Impaired Peoples' Society' (VIPS) commenced in 2005 with the hope to create a countrywide network of University/college graduates with visual impairment. Although this organization is a network of graduates, they have also extended support services regardless of educational level, and socio-economic status. This organization works mainly in the field of protecting rights

for people with visual impairment. For this purpose they pursue lobbying and advocacy in order to secure/ preserve the rights of persons with disabilities, particularly for people with visual impairment, in various national policies developed by the government. VIPS also works to ensure the issues related to the interests of persons with visual impairment are included in various government action plans and/or strategies in the context of 'Persons with Disabilities Rights and Protection Act, 2013'. Alongside this, VIPS has been working with the 'Bangladesh Bank' regarding eliminating the barriers experienced by people with visual impairment while receiving banking services. They also advocated with Bangladesh Bank to eradicate the obstacles to providing loans for self-employment from the banks so that loans could be accessed easily by persons with visual impairment. Among their major activities, VIPS creates the scope for employment in diverse workforces, negotiating to empower people with visual impairment in all spheres of their lives, and many other activities that they consider important. The organization also has projects on providing mobility devices (such as white/digital canes), screen reader software and Braille printed national textbooks for students with visual impairment.

Vignette 4

Physically-challenged Development Foundation (PDF)

PDF, a non-profit organization, works for the benefit of all types of students with disabilities in some universities. A student with a disability can obtain PDF's support from the day s/he enrols in University. PDF's activities vary depending on the type of University (public or private) and the nature of a student's needs. Commonly, their voluntary activities range from supporting newly enrolled students with disabilities in filling out admission forms and helping them to find their way to reach admission offices as well as other offices in a University. PDF also negotiates with the University authority to provide early accommodation for students with disabilities in residential halls from their first year, since most of the universities only provide this facility to students from second year. Moreover, through their '*Writers Bank',* PDF arranges voluntary writers (scribes) for students with visual impairment doing examinations. Another program is 'Voice bank' through which they provide recording support for students with visual impairment.

According to their experience in public universities, most students with disabilities severely struggle with financial problems since most of the students come from insolvent families and the students cannot work part-time to earn money as do their non-disabled peers. Therefore, one of the major activities of PDF is to arrange scholarship facilities for those students with financial insolvency. For this, they raise funds from corporate organizations as well as the rich people of the society, and sponsor necessitous students' expenses. Iftikhar appraised this stipend commenting:

> *That (amount) may be nominal, but they are offering it every month. As a result, students who are in financial crisis can get a little relief with this stipend. Disabled students are not able to access paid tuition, and bear their own costs unlike others without disabilities. Again, most of the disabled students are from poor families. Therefore, this small amount of financial support is also a great backup for them.*

PDF sometimes arranges motivational seminars for students with disabilities, where famous personalities from society deliver inspirational speeches that motivate the students to avoid feeling inferior because of their disability and to find ways to progress themselves. Besides, for the students who are at the terminal stage of study, PDF arranges career counselling and workshops, and training on job-oriented skills such as preparing a CV, searching for jobs online and applying for jobs.

7.3.1 Specific support for technology

Most of the support services from philanthropic organizations regarding technology included procurement of devices and necessary specific software, training on basic computer skills, promotion of networking, and support to solve any technological issues experienced by students with disabilities.

The Visually Impaired Peoples' Society (VIPS) has been providing computer training for persons with visual impairment since 2007. At the beginning, the training was need-based; therefore, it covered only the skills that were necessary to operate computers. Structured training modules, fixed training duration, and assessment were not offered. Some training was for two months, some was for one month, while other training was for five to seven days. Afterwards, VIPS redesigned the course considerably and upgraded the duration to six-month-long basic courses to meet the requirement of the Technical Education Board. As a

formal course under this Education Board, VIPS was required to include topics such as Microsoft Word, Excel, Power Point, Access, and the Internet.

Due to VIPS membership policy, students could not become members of VIPS before their graduation. Nevertheless, they could participate in the computer training provided by this organization. The General Secretary of this institution reported that numerous visually impaired students from the University of Dhaka participated in their training programs. Regarding this technological support, there had been no institutional communication between the University authority and this organization. The General Secretary perceived that, despite having no institutional contact, students from this University participated in VIPS' training programs on their own initiative. Many of the students were referred by ex-trainees from the same University. Nonetheless, as the training venue was distant from the University, it became very difficult for students with visual impairment to attend the venue for the training sessions. It was observed several times that students remained unable to reach the venue before sessions started. Furthermore, sometimes the students from the University could not attend sessions during heavy rain, or when transport was unavailable. Consequently, the students asked VIPS to conduct the computer training at the University campus. However, VIPS staff advised that they could not implement any such program due to the absence of a formal expression of interest from the University authority.

One of the most important services by Physically-challenged Development Foundation (PDF) was to provide training on basic computer skills for students with disabilities in the country's three largest universities. As they did not find students with any other type of disabilities amongst the enrolled students, PDF included only students with visual impairments and students with physical disabilities in those training programs. The training was for one and a half months, and PDF included both types of students with disabilities in the same classes. As students with a visual impairment needed to depend on different software in order to operate the computer, there were two trainers in each session- a sighted trainer for trainees with physical disabilities, and another expert person to facilitate training for students with visual impairments. PDF had approval from these universities to use the universities' departmental computer laboratories as the venue for the training programs. PDF had to provide the necessary software since the University computers were not equipped with specific software and adjustments for persons with visual impairments. The sessions were conducted using open-source software such as *NVDA,* as the trainer considered that using cracked *JAWS* in training might not be appropriate due to copyright issues. On the other hand, the trainees with

physical disabilities were supported by sighted trainers following the usual process of computer training.

Besides this computer training, PDF had a 'Voice Bank' service for students with visual impairments. They had sighted volunteers who assisted by recording various textbooks or reading materials for different courses. When a student with visual impairment needed audio material, PDF provided the audio version of the requested book, or reading material, through emails or flash drives.

There had been a branch of PDF at the University through which support such as computer training, voice bank and writers' bank was provided to students with disabilities. In addition, the members of this branch provided technical support voluntarily. This organization had no notable formal relations with the University administration despite permission to use a departmental computer laboratory for their computer training program. The PDF staff reported that, although they always informed the University authority regarding any updates of their activities on the campus, they could not initiate any partnership arrangements with the University authority regarding technological support for students with disabilities.

It was important that PDF had involved students without disabilities to work closely with students with disabilities. This approach encouraged interaction between both the student types, which had been proven to be important in mainstreaming the issues of disability in society. The social model of disability also advocates for this kind of interaction that enables "non-disabled or able-bodied/neuro-typical individuals being able to learn from people with disabilities, and viewing them as valuable members of society" (Cameron, 2014, cited in Kattari, Lavery, & Hasche, 2017, p. 870). The staff from PDF advised that they had intentionally introduced these two types of students into the volunteer team so that the practice of inclusiveness could commence among students from the beginning of their University life. They anticipated some awareness regarding the rights of the person with disabilities, and that the responsibilities of a non-disabled person in an inclusive society would grow among students without disabilities, while working together with their disabled peers.

7.3.2 Purpose of support

According to the general secretary of VIPS their main purpose was to strengthen the relationship among the community of persons with visual impairment. They considered that,

bridging between persons with visual impairment from different generations through their organization would be beneficial for exchanging experiences that would play an important role in the lives of the members. For this, VIPS set up a platform where people from different generations could interact with each other regarding their views, knowledge, information, and skills, consequently extending their social networks.

The staff interviewed believed that, despite possessing equal merit, eligibility, skills, and physical fitness, persons with visual impairment remained under-privileged due to the lack of opportunities to learn and use technology. As the social model explains, individual impairment is not the origin of disability, "it implicates collective thinking and actions which exclude, oppress and devalue disabled people" (Scullion, 2010, p. 701). Therefore, VIPS had initiated digital technology services to support persons with visual impairments to acquire digital skills and become capable of creating their own positions in society. The staff from PDF echoed a similar purpose for their technology support which aimed to increase the digital technology competencies of students with disabilities. They believed that digital competency could eradicate the barriers persons with disabilities were experiencing in all spheres of life.

As reported by the participants of this study, the University had not been providing an effective digital set-up which could meet their technological needs. Rather, in many cases the University compelled these students to become adjusted within the generic technology set-up which had been designed and provided solely for students without disabilities. This arrangement provided a sense, to most of the students with disabilities as well as external organizations such as VIPS and PDF, that the University lacked an approach of 'inclusiveness' in addressing the diverse needs of students. Understanding this, as stated by the staff of the organizations, they had endeavoured to address the impairment of the students as an individual difference rather than considering it as an individual 'problem'. These organizations perceived that students with disabilities would use the technology in their own way. Reviewing the purpose of these organizations, it becomes evident that their technology support services aimed to increase the accessibility of support, as well as creating an inclusive space (Kattari et al., 2017) in the University for students with disabilities.

7.3.3 Understanding the technology needs of students

When asked about how they could understand the needs of students with disabilities for technological support, varied approaches were evident in the two organizations. VIPS staff reasoned that since every member of this organization was a person with visual impairment, they could understand the needs of the students based on their own experiences of confronting visual impairment:

> *It is indeed unfortunate for us that all of our members have vision impairments, but the positive side is, with our own experience of 'blindness' we can anticipate what another person with the same impairment may require. It helps us to take appropriate measures to provide supports that they desired (General Secretary, VIPS).*

Beside this insightfulness due to a similarity in disability, VIPS often contacted persons with visual impairments through the members of the organization they were working with, regarding the needed and/or expected facilities that VIPS could provide. In this way VIPS collected primary data to design their support provisions.

VIPS' approach to generating an understanding of students' needs from the target population themselves had significant outcomes. Firstly, the expectations and needs of the stakeholders were practically addressed in the service provided. Secondly, as the service recipients were included in the support service planning, they valued the support and thus could overcome the stigma resulting from their disability. The opportunity to participate in this type of approach empowers a person with a disability, and motivates them to be similarly engaged in decision-making in other fields of their lives.

PDF mostly depended on their volunteers in universities to identify the needs of students with disabilities. The volunteer team, consisting of students with and without disabilities, maintained regular communication with students with disabilities regarding their personal wellbeing, the necessity to minimize disabling conditions, and for counselling purposes. Due to the informal relationship, the teams were able to identify any particular or collective needs of students with disabilities. Through this social network of student volunteers, PDF obtained information to plan support services.

In addition to this informal approach, PDF conducted a formal survey among all students with disabilities in the three universities each year. In the survey students with disabilities were asked for feedback on the existing services, and about their needs for further facilities.

PDF's Chairperson considered this formal survey as a significant tool to identify the actual needs of the students:

> *From our annual survey last year we became aware of a rising need to support students with disabilities to learn how to use digital devices, particularly, the internet. We then asked our University teams to collect more detailed information from the students to understand what actually they wanted from us and what would be the contents of a training workshop on technology. From the outcome of that consultation, we designed a one and half month's basic computer training program this year.*

7.3.4 Network with students with disabilities

It appeared from the interviews with these organizations that they had a significant network of people with disabilities across the country. Some of them hold responsible positions in the organizations while others were involved as beneficiaries of the services the organizations provided. It was significant to find that the persons with disabilities were not only beneficiaries of the services, but that some of them held leadership roles in organizations working for persons with disabilities.

The communication between the organization and person with disabilities occurred in many ways. As informed by the General Sectary of VIPS, generally, the organization approached any person with a disability who was accessing various support services. However, sometimes an individual person with a disability contacted the organization directly for support. VIPS had created a network of 2300 persons with visual impairment all over the country; mainly, they communicated with these people through mobile SMS. The individuals who were connected with VIPS through mobile communication disseminated the organization's activities to other people with disabilities around them who were not on the VIPS contact list. Thus, a double layer of social networks was evident in terms of communication between the organization and their service recipients:

> *Many of our members have access to the schools for the blind or inclusive schools for their job purposes. They inform the students of those schools about our activities. We noticed that the students who were linked with us encourage other students in their network to contact us for our services (General Secretary, VIPS).*

PDF has a university-based network of students to operate their activities. There were student-led working committees in each university where students with and without disabilities interacted together to plan support services for their campus. On many occasions student committees from different universities work jointly providing opportunities to extend networks across other universities. The positive outcomes of this bridging network between universities were much appreciated by the staff of PDF interviewed. According to him, this networking was effective for learning about particular provisions being implemented in specific universities; if appropriate a university committee could replicate similar provision in their own university. Additionally, this inter-university sharing allowed students with disabilities to expand their social networks to other university students.

7.3.5 Perception regarding the impact of their support

Both the organizations perceived their technology support as effective in many ways. This claim was supported by the student interviewees, who stated that the training workshops on computers and the internet, provided by philanthropic organizations, had eliminated the students' hesitation to commence using digital technologies. Likewise, a staff member from VIPS believed their basic computer training service provided confidence to a person with visual impairment regarding using computer packages, disability specific software, and browsing the internet. She later explained that the emergence of confidence due to computer training reinforced an understanding among the students with visual impairments that, if they could obtain technology skills, it would influence their independence and choice. She provided an instance regarding how skills in technology impacted on the acquisition of knowledge and information in everyday life:

> *No newspaper has yet been published using Braille in our country. We were dependent on sighted people to know news from printed media. But when we became skilful at using the internet on our smart phones or computers, we could easily access any online news portal with the support of screen reader software.*

As students with disability can collect information by themselves using the digital technologies, they do not necessarily need to depend on others for knowledge. This kind of independence enables them to choose for themselves according to their areas of interest. For instance, without help from a sighted person, they now know if the information comes from the sports page or the literature section of the newspapers – previously they were dependent

on a sighted reader to read that out and to make choices about what was to be read. Screen reader software and the internet have promoted independence and choices in their lives.

This staff member also believed that computer training programs function as a tool for the inclusion of persons with disabilities by enabling them to perform most of the digital activities that persons without disabilities do:

> *At present, Facebook has become an important social media that can keep the individuals connected to many other things. There are many government and private offices where it has been almost mandatory for staff to have email and a Facebook ID for official purposes. We have so many members who have learnt the basic use of the internet from our training programs and have become capable of adapting to new social media like Facebook. Thus, they acquire the necessary tech skills to operate their organization's social media pages as well as their own profiles.*

The support from these organizations had a significant impact on providing opportunities for students with disabilities, particularly for first generation technology user students who had no prior experience of using computers and/or smart phones. The PDF staff quoted one of their trainee's comments to emphasise the outcome of the opportunities they had created in the lives of students with disabilities:

> *As I did not own any device, I was unaware about the basic things of computers. Even more, this training was the first opportunity in my life to touch a computer and learn how to operate it. The skills I have learnt here made me interested in digital technologies. I certainly want to learn more.*

The staff of the both organizations argued that persons with disabilities who obtained technological training from these philanthropic organizations were able to demonstrate almost equal technological skills as non-disabled people showed in their workplaces or educational institutions. Consequently, the existing negative socio-cultural representation (Soffer & Chew, 2015) of persons with disabilities was significantly minimized in this society. VIPS staff believed that, by assisting persons with disabilities to enter mainstream society, the social tendency to represent such persons as powerless, helpless and only passive receivers of charity was decreasing.

It appeared to the researcher that these third-party initiatives sometimes act as substitutes for provisions which students expected from the University. Although the student participants

acknowledged the impact of these third-party provisions, these 'proxy' services could not replace the students' demand to get all the necessary support from the University. Some participants still perceived the support services from other organizations as 'charity', as these third-party organizations were not accountable for supporting them. Rather, they referred to the *Person with Disabilities Right and Protection Act (2013)* of the country, where the responsibility to ensure the supply of disability related digital products and initiation of training for disabled students had been bestowed on the educational institution concerned (Ministry of Social Welfare, 2013). Given that these organizations were playing a role which should be the University's, some of the participants argued that the University remained non-compliant with the Act. It was important to find that, despite a significant lack of opportunity in the acquisition of information and knowledge due to the social stigmatization of disability (Schomerus et al., 2012; Scior, 2011), these students with disabilities were aware of their rights. It appears that the students' exposure to a world of information through the internet, particularly their engagement with various online groups, had provided them with a sense of entitlement to the University for the provision of relevant services, technology and support services to meet their educational and social needs.

7.4 Students' own provision

The case study students and the senior students interviewed reported that it had been common for people with disabilities to experience insignificant support from the society as well as the state. As a result, they were accustomed to supporting themselves and each other through various kinds of informal personal networks.

Given the traditional practice of supporting each other, students with disabilities and their friends and peers in the University initiated a similar practice of mutual sharing of technological issues. This rather informal system included both online and offline sharing. It was evident from the interviews that the practice of 'sharing and supporting' commenced when they did not obtain the expected appropriate technological support from the University. Therefore, they developed their own support system where they helped each other regarding digital technology. This support included exchanges of software/ apps, the interchange of ideas for using technology to minimise barriers of impairment, suggesting solutions to problems to mitigate technological hazards, linking up with each other through various online groups for sharing technology experience, and getting updated information. This support

system was entirely informal in nature; there was no stereotypical rule to get the support. The contributors were mainly peers and/or senior students with disabilities who had expertise in digital technologies. Anwar, a senior student with visual impairment, concisely described how he functioned mainly as a contributor in this 'student-led provision':

> *If any student with a disability informs me s/he needs any specific software, I upload that to Google Drive and send that link to him/ her on Facebook, so that they can download that. If I do not have that specific software in my collection, I send them the link to any third-party website, so that they can download the application by themselves. Sometimes, this happens that, if any student informs me that, he/ she is not habituated in downloading softwares, then I ask them to meet me with their devices at a specific time. In this way, I try to provide them with support. At times, when it is not necessary to meet them in person, I talk to them over phone where I provide them with useful advice so that they can solve their problems by themselves. I believe that not only me, but other disabled persons who have acquired expertise in using technology, have been personally trying their best to provide support to other people, who are new users or not that skilled.*

The interview and FGD data revealed that access to and delivery of the student-led provisions mainly functioned in two ways. Sometimes, they functioned on the basis of personal acquaintance and familiarity and at other times it occurred through online social networks. Generally, the first way involved exchange occurring amongst friends and their mutual friends, and senior and junior students studying in the same department. Most students with disabilities preferred this kind of exchange; they asserted that they felt more comfortable when they could obtain support from someone they knew. Some participants stated that, if the persons were known to each other, they remained assured that they would not be harassed and that their devices and data would remain safe. Apart from this, familiarity helped mutual understanding between the service contributor and the recipient, particularly, female students who were reluctant to talk to strangers due to social and familial cultures:

> *Nazat: I do not feel comfortable to call an unknown male student to help me, it may create some issues for both of us. Rather, I would call someone who I know.*

As well as this personal familiarity-based support service, most of the students with disabilities using technology are connected through various online social networks. In these

networks they obtain regular updates on issues related to the use of digital technology and solutions regarding their technology issues from other group members. Ahmed detailed the nature of these online support groups:

> *I am linked with 'Accessible Android Bangla', a group on WhatsApp. Almost all the Bengali visually impaired experts and users of Android operating systems around the world are in this group. If any group-member requests a query, any expert refers the solution in the group. Again, if someone gets any new software or app, they share it there. There is another group of Bangla speakers that is 'Bengali Text Expert'. In this group, the technology users are from India and Bangladesh and we discuss and share the information about all types of technologies especially for persons with visual impairment. Beside these online groups for Bengali speaking people, most of the students with visual impairment in our country are linked with an international online group, the VI2. If there are various types of new information, or if anybody faces any problem, we share and solve the problems in this group. In the groups we regularly explore and share what new technologies are available for us, how a device works, how to operate digital devices, or share issues of troubleshooting.*

Additional to these public online spaces the University students with visual impairments reported that they have access to the *Dhaka University Visually Impaired Society (DUVIS)*, a *Facebook* closed group for all current students and alumni with visual impairments at the University. This closed group was created by students with visual impairments at the University. The administration role of this group is undertaken by the students in turn. Humayun, one of the initiators of this group reported that, in addition to the features that other such online groups possess, this closed group links current students with alumni with disabilities. He believed that this interaction with alumni provided opportunities to learn how the alumni managed their technology experience in the same University despite the lack of sufficient institutional provision for technology.

Since this group was exclusively for students with visual impairment at the University, they exchanged not only technological support, but also other information related to the University. Humayun also noted that, in this group, they shared exam routines, important notices, and class schedules of various University departments. Humayun explained that sometimes it had not been possible for students with visual impairments to access printed information circulated on the notice boards. As a result, they remained unaware about important information. As this information was shared on the *Facebook* group, an

opportunity for access to information for all had been created. From the conversations with the University staff, it was revealed that the University authority had no formal information or connection with these types of social media activities of the students. Nevertheless, from personal conversations with some of the students, some staff members had known about these informal online support systems led by students.

Considering the nature and approach of the student-led provision in the University, it appeared that it had broader implications for the students' technology experiences. Although this provision lacked a formal structure such as positions with particular responsibilities and accountabilities, it became popular among students for its prompt communication, flexible time for consultation, and adequate skill and commitment of the contributors to solve technological problems and queries. Consequently, it would seem that it resembled a service reported by Baran and Correia (2009), since this technology service was voluntary, and that it emerged due to dissatisfaction with the formal University provision of services, it enabled students to interact with each other in a climate of association and responsibility.

The interview data also indicated leadership attributes emerging among the contributors to the provision of these informal services through their motivation and commitment to support other students, along with their friendly voluntary communication and their creativity in providing solutions for technological issues. They were not assigned/ appointed by the University or any other organization, yet they voluntarily engaged their own time, talent and skills to support students in need. Moreover, as there were no '*business hours*' in this support system, anyone could ask for help personally over the phone or online. The participants reported that whenever they had communicated with someone with any enquiry, almost instantly they were provided with support from him/her. Selim described how one of his seniors came to his hostel room to solve a software-related problem in Selim's laptop when the senior had not been able to solve the issue over the phone. Moreover, if a contributor could not provide instant support, s/he communicated later with the particular student, and tried to solve the specific problem. Tamanna shared her experience with such a contributor to her call for support:

> *Once, I had been incapable of installing a screen reader application on my cell phone. I called one of the seniors about the issue. He provided me with some suggestions over the phone, but I could not follow those instructions. The next morning, he visited me in person to install the application.*

7.5 Discussion

This chapter has identified a range of tensions between the needs of students with disabilities and the existing provision for digital technology support from the University and other third-party organizations. It is clearly evident that the University authority had not provided equal opportunities for students with disabilities. Although the Disability Officer reported on the initiatives undertaken to provide appropriate technical facilities and support to students with disabilities, it is evident that these were inadequate. As has been noted in other studies, the role of the educational institution and other relevant stakeholders is crucial to create a technology enabling environment for disabled students to grow to their full potential (Burgstahler, 2003). For example, Cranmer (2018) has emphasised the support from school authorities on disabled young students' technology uses in north-west England.

In contrast, this chapter has found case study participants, senior students and the teacher all asserting that all the support service systems for students with disabilities were shaped based on the needs of students without disabilities studying at the University of Dhaka. The participants also argued that the University authority did not properly consider whether the facilities such as, for example, free Wi-Fi, a computer laboratory, and a cyber center, could support positive outcomes for students with disabilities. To support this claim, the case study participants provided examples of ICT course examinations which had been conducted at the computer laboratory, in this University, without the required facilities such as special software for the students with visual impairments, ergonomic keyboards and adjustable seating arrangements for students with physical disabilities. Some students with visual impairments stated that they had installed their required software in the laboratory computers. However, measures had not been taken by the computer laboratory staff to preserve this specific software. Interviews had revealed that, on the examination days, the students could not find the software they had installed earlier. These findings indicate that the University had not been successful in creating equal access to technology among students with and without disabilities, even though it should be legally ensured as the constitution of the country endorses equitable access and service provisions for all. In similar cases, Tinklin, Riddell and Wilson (2004b) also pointed out the need for an improved service provision model and necessary legislative changes.

Although the University staff confirmed attempts at providing equal opportunities for the students, a number of students with visual impairments considered some provisions for example, the establishment of separate Resource Center, as 'excluding opportunity'. They

argued that opportunities for them to use technology should not be confined to a separate place but be located in commonly used spaces. As a result of this preferred environment, their non-disabled peers, along with all the other persons at the University, would realize that students with a disability were also capable of using mainstream technology. They argued that it could bring two types of benefits for them. Firstly, the prevailing social perception that people with a disability were unable to acquire technological skills due to their disability would be challenged and gradually changed. Secondly, the students believed that, in a shared working environment, students with and without disabilities could compare their similarities and differences when using digital technology. A new possibility may even arise where a student without disabilities could attain competence in using the special software or computer functions used by students with disability. As a result, the student could help his/ her peer with disability when they experience a technological problem.

It is evident from the interviews with the staff of the university that they focused largely on material and physical aspects while offering provisions for technology. However, the students were in fact thoughtful regarding the actual usefulness of those resources. As such, there was a disagreement between the university's tendency to provide material support only and the reality of students' technological need/practice. A considerable number of participants had stated that they did not require device-related support from the university, as almost all of them had collected devices or software on their own or from other people and organizations. They were much more desirous of knowing about the various possible uses of these materials/devices/programs according to their needs rather than having a collection of 'unusable' tools. It seems the university authority had never considered this point.

Another significant finding of this chapter is that besides the institutional sources of provision by the university and philanthropic organizations, most of the students relied on another informal support system, which had been initiated and maintained by persons and students with disability. In this era of social online networking, this sort of informal support network had been formed globally. Students with disability studying at the University of Dhaka were also being benefited from these online platforms. Alongside those worldwide networks, the students with disability studying at the University of Dhaka had originated online and offline sharing and supporting systems amongst themselves. The interesting thing about this system was that, for the purpose of domestication of digital technology for students with disability, an existence of local/warm experts (Bakardjieva, 2001) had been identified who were actually friends, senior students, hostel mates or relatives to the students with disability. A

prominent speciality of these local experts was that they were not institutionally recruited technological experts; they lived within the familiar surroundings of the students with disability and the students communicated with these persons to obtain advice and assistance to 'adopt and cope with new ICTs' (Stewart, 2007, p. 547). As the warm experts belonged to the familiar circle of the students, they felt considerably more comfortable getting support from these experts rather than seeking institutional support from the university or any other formal body. These local experts had not been providing only varied and diverse services; they sometimes shaped the technology experiences for students with disability.

7.6 Conclusion

This chapter has looked in detail at the two sources of official provision of technology resources – provision from the university and provision from philanthropic organizations such as the VIPS and the PDF. It has explained what both provide and looked at both the positive and negative aspects of this provision. It has also detailed aspects of the students' own provision. The following chapter examines the data related to the fourth and final research question in looking at the outcomes of digital technology use.

Chapter Eight: Outcomes of students' digital technology use

8.1 Introduction

Following on from the first three findings chapters, this chapter tackles the fourth and final research question:

> 4. How do students with disabilities perceive the outcomes/consequences of their digital technology use at university? In what ways do students feel (dis)advantaged and (dis)empowered by their use of technology?

This chapter explores, in order, the three elements of the research question. The first research question relates to, in order, firstly the students' use of digital technologies at university, and explains what this use is (Chapter Five). The second research question is about enablers for and challenges to the students' use of digital technology (Chapter Six). The third question is concerned with the 'institutional' (university) and alternative provision of resources for the students (Chapter Seven). In this chapter the concern of this research is with the students' own perceptions of their digital technology use. Has it been effective and helpful? Do they see themselves as being advantaged or disadvantaged?

From the participants of this study some important contributions of technology was reported in general living, as well as in the learning of students with disabilities. Although there were some new users of technology among the case study students, some of the participants had been using computers and smart phones since school/college life, mainly for communication purposes. Very few students reported the use of these technologies for study prior to their higher education. However, since the diversity of study options has increased at university level, the need for using technology, and the technology options, have also significantly increased.

Since the purposes of using technology varied from student to student, the outcomes of this use of digital technology might have been expected to also vary. However, the participants – all with disability – reported almost similar consequences/outcomes of their use of digital technologies to what students without disabilities would experience. However, the participants also reported several 'unique' outcomes of using digital technologies that they

claimed their non-disabled peers would never experience. The following sections analyse the findings regarding the participants' experience of the outcomes of using digital technologies.

8.2 Independence

The participants had mentioned freedom from dependency as the most significant outcome of using diversified digital technologies. Before they learnt using screen reader software on the digital devices, students with visual impairment could not read any kind of printed material. At the same time, it was not possible for them to write conventionally, as they could not see. They stated that when they had started owning smart phones and personal computers from various sources, they began to learn the usage of varieties of helpful apps and software. From that time, they started to realize the positive outcomes of these digital technologies. Several of them also reported that, before using technologies by themselves, they had been informed by their seniors and classmates of the possibility of overcoming numerous barriers of visual impairment with the help of digital technologies. As Shahdat detailed:

> *I had a senior room-mate, who had been seen to use talking software on the computer for his study. One day I asked him about the advantages he had been receiving by using the technology as well as whether I could also learn how to use the devices and software. From him I first knew that with an OCR he scanned most of his hardcopy reading material and listened to the scanned copies with screen reader software in his laptop. With this, he did not need to depend on any sighted friend or relatives anymore in order to get any kind of printed material read by them. This bit of information had stirred me extremely. Until then, I used to go through the old-fashioned way, that is, I used to write in the Braille system and listen to the printed material by requesting someone to read it out, and I would to record it on cassettes. Therefore, I had to rely on someone else's kindness, compassion and time. Now I realized that, computers and specialized software could liberate me from this dependency on others.*

The rest of the participants with visual impairment also shared their experiences of how the diverse digital technologies had made them self-dependent:

> *Ahmed: Often we have to write applications for our studies or other official purposes. Before learning how to operate Microsoft Word, I was required to request my sighted friends to type my dictation. Now I do not need it. I can write myself with screen reader software. I also can do my assignments by my own.*

Thus, technology and its different features helped me to become self-dependent in many ways.

Nazat: The computer screen reader has made me self-reliant. Now I do not have to depend on others to type something or read out any hard copy reading material like books, teachers' handouts or articles.

Humayun: Before I started using digital technology, I used to record class lectures on a tape recorder. The cassettes were very expensive for me, so I recorded the lectures on a cassette and wrote it through Braille slate to preserve it. Later I would erase the lecture from that cassette and would use it to record another one. I had faced lots of difficulties in doing this. But now, I can record through a Smartphone as much as I wish. All I have to do is store it on a hard disc to listen to later. I must say, these technologies made me self-sufficient in many ways.

It is remarkable from these comments that dependency on others prior to learning how to use digital technologies caused these students to experience a feeling of inferiority. It was certainly not their intention that they would need to seek other people's help for performing particular work. According to the participants, their incapability to read or write without help from other people had literally presented them as 'incompetent'. Some of the case study students perceived that the help they had received from others mostly derived from feelings of "pity", or as a demonstration of "mercy" for their "incompetence". The students with disability certainly did not like this attitude toward them, since they did not want to feel like a "passive receiver". The use of technology had provided them salvation from this "disgraceful" identity. Shahdat's comment is pertinent here in explaining how digital technology affected their lives:

I would not say that these technologies have completely released us from our disabilities; however, we are now capable of minimizing several functional obstacles of disability by using these devices and software. Due to this minimization of barriers, in most cases, we are not dependent on non-disabled persons anymore. It is a colossal attainment from the technology.

Tamanna shared one of her experiences where she could not submit a course assignment for lack of the expected assistance from her classmate without disability. She had requested one of her classmates to print her assignment after composing it on a computer, but her classmate did not help her even after several requests. At that time, Tamanna was not familiar with

computers. Later she had become competent in composing her own assignments using the screen reader in laptop. As a result, she could significantly reduce her dependency on other students. She believed this transformation had been possible because of digital technologies. Tamanna perceived that her identity in the eyes of her friends had merely been as a dependent who always kept asking for assistance. According to her, technology had gifted her with a new 'self-sufficient' identity.

The freedom that had been induced by digital technology had not been only the freedom of not having to depend on other people. It was also the freedom to be able to use a screen reader, an OCR, as well as other software and applications, which released them from their dependency on Braille. It was considerably complicated as well as time-consuming to learn the Braille system for the students with visual impairment, particularly for those who were 'late blind' (who had lost their vision at an older age). However, numerous participants who had started learning Braille from an early age also stated that it took them long periods of time to read Braille (by touching the Braille with their fingers and writing on paper using the Braille slate). In addition, it was very difficult for them to find mistakes in their writing. Besides this, Braille text books were not readily available at the university. Although they could write in Braille, they still had to depend on other sighted students in order to get the printed books to be read out, and for assistance as scribes in their examinations. In other words, with the Braille system, students with visual impairments could not become self-dependent. It was primarily the screen reader software that had helped them to overcome their dependency on Braille.

> *Iftikhar: Touching and reading in Braille is very time-consuming and complicated. I think that by using digital technologies students with visual impairment can annihilate the Braille-dependent learning system. The screen reader takes away the need for me to take notes through using the Braille method. By listening to the recordings, I can write directly to a word file when I hear it. After writing I can study that by listening to the screen reader. In this way the screen reader and the digital voice recorder helped me to get rid of my reliance on Braille.*

> *Nazat: Due to the use of different software and applications of digital devices, students with visual impairment are no longer dependent on Braille. It can be said that because of technologies the importance of Braille is decreasing day by day.*

> *Humayun: For studying, the voice recorder on mobile phones had played an important role. For example, if I have to write 200 words with the Braille slate by hearing them, then it will take me a minimum of 30 minutes, because writing in Braille is very hard and time-consuming. Now if any of my sighted friends make me a voice record from a printed copy, it will take a maximum 5 minutes to record 200 words. Later I can study them playing the recordings from the mobile phone or computer again and again as I wish. If necessary, I can type 200 words on the computer hearing the audio file. In this way, my academic learning process is getting easier.*

8.3 Access to information and resources

Each participant mentioned that their use of technology connected them with the world of information. Information is a significant tool that assists a person to choose a suitable alternative for their own lives. Persons with disability, especially those with visual impairments, had been lagging behind in attainment of information. Due to the absence of any suitable system for information dissemination, most of the time people with disabilities were deprived of important information. According to Nazat, for the visually impaired, even the simple statement; 'What time is it by the clock/your watch?' was vital information which they had been unable to obtain from any classrooms or anywhere else within the university. Although the university had provided clocks throughout the university, students with visual impairment, unless they were equipped with their own 'talking watch', always had to ask the time of others without visual impairment.

According to Humayun, this again confined him within a helpless state of dependency. A digital talking watch and a screen reader for mobile phones eventually provided him and others with access to significant information like knowing the time.

Ahmed perceived that the information he collected through the internet also empowered him by providing necessary knowledge regarding any particular issues relevant to their studies. He reported that Google helped him to get instant information regarding the topic while he was in a lecture. Sometimes the lecturers' discussion could not answer all the queries raised in his mind, but Google provided him with all the information necessary to fill the gaps in his knowledge.

8.4 Access to the internet and Google

Humayun supported Ahmed in stating that the internet transformed persons with visual impairment from being in a state of ignorance to entering a state of resourcefulness, by providing access to information. He clarified this by saying that sighted friends could easily access study related information on the internet, and students like himself had been dependent on these students for obtaining internet-based materials. Later, when the students with visual impairments had been introduced to the internet with the support of screen readers and other digital technologies, their dependency on sighted peers was minimized. In this way, access to information played a significant role in eliminating dependency.

Selim also highlighted how the internet had provided him with instant information and knowledge to support his study. Previously he had to find relevant study material in heavy books in the library – all difficult to handle, of course, with his paralysed hand. But with internet access he could search for his study materials in Google. Utpal, in the same manner, was able to find information using the internet from his mobile device. To him, the availability of information had become the reason for the expansion of his knowledge - now he felt like "hold the world in the palm of my hands". Furthermore, Ahmed felt that the internet had not only been a tool for empowering him with its great mass of information, but that it had also connected him to the entire world. He reported that he had now become so dependent on the digital world, that if he lost access to online facilities for even a single day, then he would lose his sense of being connected to the world.

The internet acts like a gateway to the world of information for students with disability. According to many, their attachment to the internet provided them independence and created scope for access to information. From the data it was observed that students with disability benefitted from the internet in two ways – through the provision of a diverse range of resources and information for their studies, and also by meeting other needs.

Among the resources the internet provided, the most popular one was Google. The participants all stated that they searched Google first. They used it to source information for class presentations, and the student with visual impairment even found resources on Google that were already in a screen reader-friendly format. Thus, they no longer needed to go to the trouble of scanning hard copies of different materials in order to make them compatible with screen readers.

8.5 Connecting with each other – online groups

Humayun explained that online groups and communicating with other students online was helpful. Through online connections they could make 'help posts' that would help them, for example, to find writers and scribes. On the group walls they could post time schedules and venues for the exams.

Other group members would also come forward voluntarily to help. This was much preferred by the students than seeking out help from people they knew personally. Tamanna also reported that female students had to face more complexities, as, due to safety related issues, they could not just go anywhere to search for writers, and had to depend on others to find these writers for them. Now their accessibility to different online groups enabled them to expand their social network, which thus impacted positively on the complexity of finding scribes.

It was not only students with visual impairment who benefitted from the internet. The other students did not use any special software like the students with visual impairment did, however, the internet still reduced their hardship in studies, as Utpal explained:

> *As a person with physical disabilities, I face some problems that other students do not have. For example, I can use only one hand because my other hand is malformed. So it is very difficult for me to hold any book in one hand and turn the pages to find a specific one. For this reason, whenever I want to read a book or magazine I have to put it on a base and then read. This facility is not available everywhere. But I can find information through the internet just by a click with only one finger! For me it is easier to read online e-books or articles from Google Scholar, rather than going to a library and finding reading materials from heavy books.*

8.6 Improved social skills

Humayun stated that his social skills had developed remarkably since joining these online groups. According to him, these groups had become platforms to share his experiences and to obtain advice from people with disabilities from all around the world. In these groups he also took the opportunity to link with people who had been working to ensure the rights of persons with disabilities by providing advice as well as legal aid. He also reported his own experience where he sought advice from that group regarding his particular problem, receiving it

immediately. He also stated that although he was not in personal contact with many of the group members, they all still became friends who supported each other.

Utpal also reported his experience with the other members of these online groups. According to him, before his internet-based online blogging experiences he had no knowledge about his rights as a person with disability. He had been ignorant about the possibility of obtaining diverse as well as necessary information from the internet groups. However, later on he realized how these groups could assist him not only regarding his legal rights, but in relation to his studies, well-being, safety issues and, perhaps most importantly, updates in technology. Along the way his network with persons with disability from different corners of the world had also expanded.

8.7 Freedom from isolation – networking

Shahdat explained another outcome of this virtual world. According to him, various social media as well as online groups assisted him to overcome the isolation stemming from his disability. Essentially, this isolation takes place as people with disabilities, of their own accord, keep themselves separated from people without disabilities. People with disabilities have the understanding that because of their disabilities they have to expect and face neglect, disrespect and harassment from non-disabled persons. Due to this perception, many of them detach themselves from other people or make friendships exclusively with people with similar disabilities (Livingstone & Helsper, 2007, cited in Soderstorm, 2009). Shahdat reasoned that because of his visual impairment he could not go to places on his own like other people could. Moreover, he did not like to obtain assistance from other people while travelling in groups. His dependency on other people had placed him in a dilemma when visiting unknown places. As a consequence, he often avoided travelling. For this reason, as with most people with disabilities, a feeling of isolation had grown within him, but the internet helped him to outgrow this isolation:

> *Since I learned to use computers and smart phones, I have found a world where*
> *I could enjoy my life as I wish. I have made virtual friendships with a lot of*
> *people on the internet and they never treated me differently for my disability. I*
> *really have become able to overcome my isolation with the help of technology.*

8.8 Recognition of their abilities

Another remarkable contribution of digital technology is that it has enabled the competency of students with disability to be established amongst non-disabled classmates, students, teachers and staff at the university. As detailed in the literature reviewed in this thesis, it has been ingrained in society that persons with disability have always been dependent on others, as well as being incapable of performing tasks in the same manner as a non-disabled person can. However, technology has contributed to changing this perspective. The students have stated that although they have always been capable of performing numerous other tasks with the same expertise as their non-disabled classmates; nevertheless, they had never been accepted as 'normal' learners. However, when they began to reveal their competencies in using technology, others around them started to see them as important.

Selim speaks about this, stating that when he began sharing his knowledge of digital technology and the internet in front of his classmates and teachers, everyone's outlook towards him changed positively. He perceived that he was now receiving a level of respect from them, which he had not been receiving earlier:

> *Technologies had a role in establishing my dignity among my classmates. When my classmates started noticing that I had access to various computer software – and that I have networks with many online groups – they began to compliment me. They themselves have started to come to me with various technological problems. I know they are giving me this honour because I have proved that my technological knowledge is better than many others'.*

A new accumulation of information as well as an expansion of knowledge that followed from using the internet has been a benefit for students both with and without a disability. It was evident from the participants that they now often receive recognition and dignity from their non-disabled peers and teachers due to their ability to collect information and knowledge from the internet. However, it is expected that every student should receive equal dignity regardless of their ability. Nevertheless, the participants with disability were grateful that they had been receiving the expected recognition for their ability to collect information and knowledge from the internet. Ahmed said, for example, that:

> *In the class when I share knowledge which I obtained through the internet, my teacher and classmates start to look at me with respect. Some things that have also happened are that the teacher selected me as the leader of a study group*

because of my willingness for sharing this type of information and advanced
knowledge. Then I realized that, as I can access knowledge and information,
therefore I have acknowledgement.

In addition to the recognition of being seen as an 'able' person for using digital technology, students with a disability were now seeing themselves more as equals – for they were now performing various tasks to the same standard as their non-disabled peers. Some of them had opined that the pre-existing gap that had been present between them and their non-disabled peers was diminishing – all because of their increasing adeptness with technology.

The students with visual impairment now said, however, that they were 'lagging behind' because of study materials that were not suitable for them. They could not access all the vital information they required as some of it was printed material only. On the other hand, sighted students did not have this problem – they could stay ahead. Shahdat reported:

The best outcome of technology is that we can minimize the gap between the
sighted person, and the person with visual impairment, with its support. For
example, we cannot read printed material (like books, journals, newspapers,
and formal and important notices or advertisements) due to our visual
impairment, so a pause has been created in accessing information. Because of
this we are still lagging behind sighted persons in academic learning, getting
jobs, and in developing our life skills, despite having other equal qualifications.
Now we can use a screen reader to get online news and information for
education, employment and other purposes. Yes, still not everything is
accessible for us, but the information gap is being eliminated with these
technologies.

8.9 Self-confidence and dignity

As the participants had been considering themselves 'self-dependent' with the help of different digital technologies, another important change had materialized among them. They had begun regarding themselves as more dignified and with more self-respect than before. They sensed the existence of respect from non-disabled people as they became less dependent on others and were better able to undertake tasks on their own. Utpal stated:

One unique impact to highlight is the change of perception of others about our
capabilities. That is to say, those who assumed that we are not competent

> *because we have physical disabilities, nowadays have changed their outlook a little as they see we can use the internet and other technological devices. It is fair to say that technology helped us in a bigger way to change the perception of others about us. It didn't just help us to get our functional job done.*

Ahmed also stated that the technological expertise that disabled students had now acquired through technology brought not only functional changes (for example, access to information and the ability to read and write), but also implanted a belief among them regarding their equal capabilities:

> *The biggest influence of technology is that I can now conceive myself as 'capable' while exploring the internet. This virtual world tells me that there are many people like me who have succeeded in establishing themselves despite their disability. These things help me emotionally to consider myself a productive part of this society. This is the prime outcome of technology to me.*

The self-confidence that was already growing in the students had introduced a significant number of positive changes. According to Humayun, they no longer saw themselves as inferior, but instead as capable of accomplishing most of their study related activities by themselves. Who to ask for help, would the help be available in time or not, the disgrace of being refused help – these concerns were no longer so significant in their lives. They had now acquired the confidence that they did not need to experience the 'undignified uncertainty' of depending on others anymore.

8.10 Discussion

While discussing the outcomes of digital technologies, the outcomes highlighted by the participants were primarily positive. This echoes similar findings from Cranmer (2017) who noted younger disabled students expressing satisfaction over technology uses as it boost their confidence and performances, but with "occasional frustrations and glitches" (p. 6). Indeed, the students with disabilities in the present study repeatedly explained how using digital technology made it possible for them to be like students without disabilities. A compulsion for acquiring this 'equivalency' was clearly evident amongst them. It can be said that, for them, digital technology played the role of being a 'tool' in acquiring this equivalency with their peers without disabilities. Moreover, the participants' focus was on how technology, as a 'tool', had helped them to overcome and outgrow social, environmental and attitudinal

barriers, and assisted them in acquiring equal standing with non-disabled students. Keyes et al. (2015) illustrated that the 'interdependent caring relationships' pave the way to empowerment, while self-determinacy leads to independence. In this context, however, the lack of established institutionalized infrastructure and processes build the perception among the students that without their self-initiated social-capital based support, they would simply remain helpless. In a way, they could not afford to question the usefulness of their new tool – for that would be like questioning everything that had given them newfound freedom. So, it was natural that the participants were only filled with praise for the technologies they were using.

The participants claimed to have found self-confidence and independence from technology. However, there were issues. In Chapter Seven we saw that these students (particularly those with visual impairment) still needed assistance from others if errors or faults occurred in either their equipment or the software (such as when their device 'crashes', or software does not seem to be functioning properly). Also, in selecting equipment these students typically received help from others, particularly their parents. In fact, they might have attained self-dependency in using the technology, but in the all-important decisions that have to be made (e.g., devices or software to be used, the modality of the technological support system, etc.) the help of non-disabled persons was used.

Apart from this, the participants reckoned that they had acquired expertise that was approximately equal to that of their non-disabled peers, although there was no easy way of verifying this claim. The participants strongly highlighted the role of online networking as a benefit of their new skills. They became capable of amplifying the extent of their knowledge, skills, and communication by connecting to various online groups. An advantage of this sort of online connection is that it tends to build up networks free of the stigmas derived from their disabilities (Soderstrom, 2009). Most of the online forums created the scope for students with disability to express/expose their skills and competencies without disclosing their disability-related identity. From the data collected, it was found that the significant fact has been unveiled that these online networks also affected the offline relationships of students with disabilities. For instance, the scope for an offline friendship or communication is created when a sighted student voluntarily supports a student with visual impairment as a scribe in the exams, after responding to a help post on Facebook. At the same time, opportunities are created to become online 'friends' with someone from the other end of the world who has a similar disability. Prior to this online networking, these students with disabilities used to

hesitate to appear in front of others and hide themselves away. As a consequence, they used to have a very limited social network. But now their online ties have created opportunities for them to connect to a larger network, and to enrich their social capital, both online and offline.

8.11 Conclusion

This chapter has looked at the many outcomes of students with disabilities being able to use digital technology. These outcomes included independence, access to information and resources, access to the internet and Google, connecting with each other, improved social skills, freedom from isolation, recognition of their abilities, and self- confidence and dignity. The chapter also explained that there were very few, if any, significant negative outcomes of digital technology use for these students. This chapter concludes the four chapters detailing the findings of this research. It is followed by a discussion of these findings, and the conclusion in relation to the research.

Chapter Nine: Discussion and conclusion

9.1 Introduction

In this chapter, the discussion connects the dots among the findings and the theory and research presented by the literature review. Therefore, this chapter will discuss the implications of the empirical findings presented in Chapters Five, Six, Seven and Eight in relation to the four research questions stated in Chapter One. This will involve consideration of the major themes that have been uncovered and the broader issues that they relate to. The chapter concludes with the benefits of the study, its limitations, and suggestions for further research.

9.2 Discussion of the study findings

Though both in the literature and findings it was clear that the use of technology supported the students with disability substantially towards their higher academic achievements, a pattern of difference and discrimination appeared in terms of the utilization of technology in relation to institutional supports and the socioeconomic background of the students.

9.2.1 Students' digital technology access and use

This study found that almost all of the participants were using different forms of modern technologies (mobile phones, computer, voice recorders) like those used by other mainstream students, which they used for both personal and academic purposes. The findings resemble the depiction of Morosanu et al. (2010) and it has been observed that peer interaction influences the uses of technologies and the lived experiences of the students with disability. Specifically, the findings showed that the senior special needs students often guided the freshmen and shared, informally but intensively, the challenges along with solutions that had worked for them. Following Morgan's (2012) illustration of the importance of enriched student experiences for quality higher education, this study bear testament that the uses of supportive technologies not only enriched the lived experiences of the students with disability but also helped them to socially integrate and have better on-campus life.

In terms of choices of mobile phone technologies, two issues prominently influence the decision – the budget and the convenience of using and accessing resources as this study found. In both cases, the suggestions of senior students strongly influenced the choice. The lack of formal support mechanisms, in many cases, also made the choices revolve around

availability. Various of the case studies revealed that the students were influenced to use Android phone by the seniors. Traditionally, in Bangladeshi universities, senior students take on informal roles in assisting new students, particularly in coping with their new life experiences, and thus the new students tend to mimic their behaviour and activities.

Although nine of the ten students studied had computers of their own, most of the computer users were not particularly knowledgeable about the configuration of their devices. Despite the difficulties they had in using them, these students wanted to persist in the use of digital devices for their studies. More importantly, the students perceived that they needed to use these devices, that to get anywhere in their studies they needed to both have access to, and master the use of, digital technology. In fact, the digital technologies were reinforcing the students' sense of their place in the world and the students felt they needed to *master* their use of them in a manner which was, to some extent, supported by Selwyn et al.'s (2017, p. 166) study.

It has also been observed that, the students with 'disabilities' who participated in this research were working hard to master the use of technology, as they perceived that it would allow them to be competitive in terms of academic achievements. Though they and others perceived the use of technology as 'normal' in contemporary tertiary study, the technologies also clearly played a vital role in their social and academic interactions. As illustrated in the study by Lairio, Puukari and Kouvo (2013), higher education is a prominent time for young people to develop social relationships and academic networks. It was evident in the findings of the present study that the uses of the technologies enabled the students with disability to effectively communicate and to engage in stronger peer interactions.

The findings presented the technology as the enablers for the students with disability to be 'normal' and to have a 'normal' life, which in turn promoted social integration and stronger inclusion opportunities for them. As Scullion (2010) states, the Social Model argues that often there is "a devaluation of the worth and citizenship of people on the basis of their disability status" (p. 700) and that this ostracizes those who are not 'normal'. Terzi (2004) adds that the Social Model theorists "oppose any idea of normality seen as ideologically constructed in order to control and exclude disabled people from the structure of a society that has no interest in accommodating them" (p. 153). Therefore, the participants' perspectives that their use of technology made them feel 'normal' or 'normal-like', and seem so to others, were shaped in part by this deficit view. At the same time, however, their incipient independence in learning and interacting through technology began to liberate the

students with disability (and possibly those without disability) from this deficit view, given that it made evident their capabilities in academic achievement and social interaction, leading them towards an enriched student life.

However, though the technologies allowed the students with disability to have a decent social life with necessary peer-interactions, the academic aspects of the uses for academic purposes remained full of challenges. In many cases, for example, the students had to depend on the choices of people who either helped them to buy a computer or who gifted them a device. Despite inconvenience, they used them as best they could, accepting the lack of social capital as a challenge towards being successful at university.

9.2.2 Enablers and challenges

This section relates directly to the second research question which focused on the barriers and enablers towards utilization of digital technologies by the students with disability. From the data analysis it was quite clear that the prominent driving force was 'inclusion' and often the students with disability perceived technology as a way out from their limitations. However, the findings presented the challenges of 'lack of financial solvency' and 'unavailability of appropriate technologies'. In the discussion of these enablers and challenges, the core findings should be focused on the inadequate and largely absent institutional support and lack of clear guidelines in the institution regarding when, how and what technology and resources should be acquired so the target learning outcomes could be achieved by the student.

9.2.2.1 Enablers

The participants mentioned a number of enablers and drivers which had supported their digital technology experiences. From their perspectives, these enablers not only made them able to operate digital technologies, but they also strengthened their ability to cope with further technological issues as they arose during their overall technology experience in HE. The primary enablers mentioned were: support from family, friends and seniors; philanthropic and other organizations; the drive to be normal; the drive to succeed; free and pirated software; and enablers acting as challenges. However, despite the enablers and the benefits of technology, the overall experiences were not consistent but differed from case to case and were often related to students' socio-economic class and background. Similar results have been presented by Morosanu et al. (2010) about other contexts. This study presents the

provision of informal unofficial supports which often, in the context of Bangladesh, depends on interpersonal communications and relationships because of the non-existence of an established institutional process.

It is interesting to note that Seale's (2013) study involving 31 participants at a UK university indicated that these disabled students' use of technology was significant, and that they also had a mix of positive and negative feelings about how technology has impacted their lives.

In both contrast and similarity to the participants in the study reported in this thesis, , the participating students in Seale's research generally made positive comments about the influence of their families, and noted the negative influences related to limited access. They also saw as enablers the support given through their universities, including via tutors, support staff and other students, and had networks of beneficial online contacts, including through Facebook. Such research points to the benefits to be gained by universities conducting ongoing research of its students in these areas.

9.2.2.2 Support from different sources

As the analysis depicted, students obtained their computer devices from different sources – from family members, purchased from their own savings, or donated to them by various philanthropic organizations. While being supported by family or their own savings is highly dependent on the socio-economic background of the students, the donation by the philanthropic organizations tells a different story. Interestingly, a common key phenomenon observed among the participants is that they preferred to consider these donations as their competitive achievements rather than identify them as gifts. The perception among the students was that they got the support because of their academic performance and meritorious presentations (for example, the case of Humayun and Tamanna). The underlying cause for this has actually been illustrated by Morosanu et al. (2010, p. 675), which is that students with disability often reject supports which are unilateral, infrequent and hierarchical, and prefer to accept support from sources which are emotionally warm and equitable. This endorses the importance of self-respect and indicates the tendency of the desire to achieve self-dependence.

It was perhaps true that some students could win devices through competition, but generally, upon further questioning, it was found to be an exaggeration. The philanthropic organizations and NGOs were mostly set up to provide resources for those with disabilities under the

premise that such students needed support either because of special needs and/or because their disability prevents them earning any substantial income for themselves which would otherwise help to meet their needs. The role of NGOs or Philanthropic Organizations – in the higher education of disabled students – is significant in many countries (for example Dill, 2014; Singh & Sethi, 2012). In regard to India, in the field of education, NGOs work in higher education (as well as all other areas of education) with sponsorship from the community, business houses and governments (both central as well as state) (Singh & Sethi, 2012; p. 8).

Dill (2014) explored government/NGO relations in health care and disability services in Croatia and found that none of the approximately 1500 NGOs working for health services had prioritized supporting people with disability, or specifically students with disability at HE. However, it is those NGOs with 'legacy missions' who help people with physical 'disabilities'. Lang (2000), in considering empowerment and the social transformation of people with disabilities, found that "NGOs have played a key role in the provision of community based disability services" (Lang, 2000, as cited in Singh & Sethi, 2012; p. 3).

Such intervention, or assistance, from NGOs or 'Philanthropic organizations' engendered mixed feelings among the participants in Bangladesh. Although they were, of course, happy with what they had been provided, on many occasions the devices were not adequate (as explained previously). The dilemma began with ownership – as gifts, the students did not have typical ownership, as they did not pay for the equipment they were using. As such, it was challenging for them to deal with the 'gifts' when the equipment did not meet their needs. They were caught in a difficult position as they did not want to seem ungrateful, but at the same time the gifts sometimes did not meet their needs. While not wanting to come across as feeling entitled, the students just wanted to have been able to provide for all of their needs themselves.

Thus, they felt disempowered. This was true in relation to their ownership of devices such as laptops, PCs, phones and screen readers and also in relation to their use of various applications, and in relation to the internet. The students needed access to good and reliable hardware and software. For example, browser speed was important to them. Therefore, they did not want to settle for B-grade equipment. Thus, this study found, that the reality associated with gifts in many cases made the students feel dependent and disempowered. These feelings of empowerment are crucial for developing their identity both academically and personally, as also observed in the discussion of Christie (2009).

Over twenty years ago Dempsey and Foreman (1997) in their research at the Special Education Centre at the University of Newcastle in Australia, tried to identify what empowerment actually is (p. 287). In providing a "conceptual analysis of empowerment" they refer to it as a psychological construct best explained by defining its components (p. 287). Thus, in defining empowerment they list its "essential components" (p. 289) based on characteristics of empowerment taken from twenty studies published between 1976 and 1993 (pp. 290-292). These include: sense of control as well as self-efficacy, participation and collaboration, meeting personal needs, understanding of environment, personal action, and access to resources. Very similar findings have been found in this current study, despite the contextual differences and as presented before this is part of developing self-identity.

Nonetheless, the important aspect presented in the analysis is the support from respective families of the students. Family support was recognized by the students interviewed as an important enabler, and comprised financial support (enabling purchases) or the actual provision of technological equipment. This support was also provided through purchasing necessary software, providing internet data, paying training program fees and maintenance, informing the students of relevant new products, lending their own equipment, and helping them with technology related issues. However, as observed, supports from families are often inadequate and not generalizable. The poorer families often channel their funds for another child and even if families tried to support all of the children equally, that may not be adequate for the needs of the students with disability.

As found in the analysis, the support could come from parents, siblings, relatives and friends (both 'disabled' and not). All this help, however, was dependent help. Ideally the students did not want to rely on others. In particular, they did not want to become dependent on or bother their friends.

From the analysis, it is unambiguous that the students with disability are aware of the benefits of using technology and therefore perceive that the technology would enable them towards becoming self-dependent. However, as argued above and depicted in the analysis, technology can authentically empower only when it can be accessed unconditionally and can be utilized to their fullest needs.

9.2.2.3 The drive to be 'normal' and to succeed

As Bliuc et al. (2011) portrayed, social identity is what someone perceives themselves to be socially and the findings of this study resonate with that. The driving factor for the students with disability to be competent in the uses of digital technologies was to be and act 'normal'. The dilemma is deeply-rooted within the socio-cultural settings and the lack of proper inclusion strategies. Although the struggle that the participants faced had already been overcome, it fuelled their aspiration for becoming further self-dependent and for a normalized life where they could be competitive and become successful.

Furthermore, the outdated Braille system, which is rarely applicable to real life functioning, as well as the lack of proper and necessary institutionalized support pushed them further towards that determination. Being different in an overpopulated society not only made them stand alone with their own sets of challenges, but also forced them to find ways of utilizing opportunities and achieving success. In this situation, modern technology offered them not only a pathway for overcoming their challenges, but also helped them to perform independently to some extent. This resonated with Nazat's declaration: 'I want to show my cousins and other relatives that I don't need their support in my everyday life events' adding that she wanted them to see that she could perform at least few things on her own.

This helps to explain why these students wanted their independence. It wasn't just for functional purposes such as needing to perform in their studies – it was so they could show others they were capable. In other words, they wanted acceptance and prestige; they wanted to feel good about themselves. They wanted to show themselves that they were capable. They did not want to be dependent on others or limited by their disabilities. The students' desires can easily be grouped under one factor – they sought both independence and empowerment, and they sought these in order to succeed. Some of them stressed that they wanted to work out their problems by themselves, and only then reach out for help if they still needed it. They wanted to be self-reliant rather than rely on others.

As explained earlier, the process of normalization though challenges by the Social Model as stated by Winance (2016), however it could go beyond to change the societal norms in a way where the disabled would not need to fit in but will feel indifferent in comparison to the non-disabled counterparts. And, that could be achieved by empowering the disabled to make their own choices and decisions as supported by Keyes et al. (2015).

Morris (1997) argues, "if we want to empower people we must learn from the Independent Living movement, from the people who struggled against segregation and insisted that access to personal assistance over which they have control is a civil rights issue" (p. 54), thus placing the emphasis onto the concept of the 'disabled' having significantly more control over their situation. The importance of such findings is that they clearly point authorities in the direction of greater control by 'disabled' people over their own needs.

9.2.2.4 Numerous challenges and the importance of support

Although organizations working for the welfare of persons with disabilities had positive roles in enabling students with disabilities, sometimes this help was inadequate – either inappropriate or simply not enough. The students receiving the help knew they needed to be more self-reliant. There is no doubt that in being so reliant on others they felt disempowered.

Particularly because these students wanted to be independent and self-reliant, they had a lot of work to do (on top of their studies) in order to reach the standards of technology knowledge that they perceived they required. This meant extra time, extra courses, and also finding the motivation to put mental energy into the task. The students interviewed were getting help, but that help was not sufficient to function, and therefore to contribute to developing their self-identity and socialization.

Students had much to say about the help they received, or did not receive, from others. They stated that teachers sometimes were dismissive – they sometimes did not allow the recording of lectures and they did not seem to care much (or know much about) the needs of students with disabilities. Other comments related to teachers being uncaring or annoyed when approached for help, parents not wanting their children to use digital technologies, and hostel wardens ridiculing students when they sought assistance.

This non-cooperation of others created a feeling of helplessness. The typical profile of the students who participated in this research is that they were strugglers, and they were supported. Part of this support was from friends, much of it was from family members – and these students still felt disempowered.

The profile of these students is the profile of students we could arguably say are 'successful' students, because they achieved placement in a university (the University of Dhaka), and they were doing well in their studies and learning to use technology to assist them in overcoming barriers to their learning. However, what about other students? Those who did not have as

much drive to succeed in the face of significant challenges, and who did not have financial and or parental support – did they simply 'not make it' to university?

Significant challenges are often reported in studies of 'disabled' higher education students worldwide. For example, insufficient modifications to infrastructure represented one of many challenges for disabled students according to Hadjikakou and Hartas' (2008) large scale study of higher education 'disabled' students in Cyprus. A lack of assistive technology was another relevant factor, among a list of many more.

This raises questions. What is the link between support and the drive to succeed? It appears from this research that supported students have more motivation, or perhaps they just have more resources. It seems apparent that unsupported students, as well as being less likely to succeed, are more discontent and more likely to feel disempowered. Thus, the continued push for greater provision for 'disabled' students is very important.

9.2.3 The provision of technology

This section relates directly to the third research question that focuses on the students' experiences. There were both positive and negative aspects to the provision of technology resources as it sometimes leads to further dependency in some aspects while also supporting the development of self-dependence.

9.2.3.1 Effective provision of resources

Some of the students interviewed had a positive outlook on the services offered by the university. However, beyond family support and well-functioning social capital, self-motivation, and determination were their most prominent assets. The most significant positive comments about resources seem to be about several of the teachers of the university providing helpful resources such as soft copies of reading materials (Shahdat) or emailing the same. However, other students reported the teachers' reluctance to be helpful. Overall, there were few positive comments about the provision of resources by the university, and this tallied with research done elsewhere. Student dissatisfaction with the provision of resources is not uncommon. In regard to issues in the provision of resources for disabled students, Hadjikakou and Hartas (2008) named many such issues, including variability in the provision across institutions; a lack of trained tutors; and limited awareness of issues related to assessment and identification. However, in terms , this study was not able to substantiate any

user experience of institutionally provided software and assistive technologies as most of the disabled students used pirated software they accessed through other students and friends. The assistive technology provided was deemed both outdated and inaccessible.

9.2.3.2 Disempowering and negligent provision

The University of Dhaka had provisions for providing access to various technologies. However, the students interviewed felt that these facilities were suitable for non-disabled students, but not for them. There were, however, other concerns.

There were other examples of students feeling 'badly done by' – that their needs were not being understood or cared for by university staff. All students reported their dissatisfaction with the university initiatives. Some even commented that there had never even been any noteworthy support. The issues they had included a lack of the promised provision of internet access in the university accommodation facilities for women, while male students were provided with such access; a lack of resource centre staff skill or helpfulness; a lack of space for students to use their own computers (laptops); a lack of appropriate support services; and a general lack of resources within the university, including software.

Overall, for the participants of this research, it is not enough that their IT resource needs are addressed. It is not enough that they are better resourced. As Rose and Shevlin (2004) reason, the marginalized (including disabled people) often experience a wide range of difficulties depending on their nature of disability and marginalization. With limited resources though they could limitedly access the physical and curricular provisions, however, fuller forms of participation remains restricted. In addition, the continuous feelings of disempowerment due the limitations imposed by respective disability add greater burden for them which is why they often do not achieve at a level commensurate with their ability. For this reason, it is empowerment as a whole (with being well-resourced as just a part of this) that they need and therefore desire as the data suggested.

In this sense, the idea of increased participation needs to be seen in more nuanced terms. Farmer, Riddick, and Sterling (2002) stated that three levels of participation and provision should be considered for students with learning difficulties. The first is the personal level (such as providing counselling services, adapting the curriculum, and modifying teaching and other services such as a sign language interpreter or materials in Braille). Second is the organizational level (changing institutional procedures, training staff and modifying the

environment). Third is the ideological level (debating models and policies, striving for equality of opportunity). In this model it can be seen that all the practical needs of people with impairments need to be addressed, but perhaps most importantly is the need to address ideology.

Other factors that came out of the findings included claims of marginalization through a lack of provision of university resources, and the students being reluctant to come forward with their needs, especially when they perceived that they were ignored by the administration when they did report their needs or complaints.

Overall, the students interviewed indicated inadequate provision of resources for 'disabled' students at the University of Dhaka, and that issues that need to be addressed include not only the provision of physical resources, but also the attitudes and education of teachers, and institutional change. Similar findings come from other studies. A study by Tinklin and Hall (1999), cited in Hadjikakou and Hartas, (2008) found that the quality of provision for students with disabilities in higher education depends on attitudes, experience and awareness about disability among staff and students, and that a focus on these factors is often lacking.

In regard to the need for institutional change, Tinklin, Riddell and Wilson (2004b) studied the provision of higher education for disabled students in Scotland, and noted that it was in 1993 that Scotland began to provide funding to improve provision for disabled students. They also argued that most British Colleges and Universities were inaccessible to disabled students as recently as 2003 (ten years later), and – as appears to be the case at the University of Dhaka – that the situation is only improving slowly.

Tinklin, Riddell and Wilson (2004b) also pointed point to the need for an improved model of provision, and legislative changes. They conclude that models of provision may be focussing too much on providing disabled students with individual support, rather than on more fundamental institutional change. The participants of this research would agree with most of this, but still stress that they do need individual support, as well as 'institutional change'. Supporting that, where Hadjikakou and Hartas (2008) completed their research, provision was not embedded in institutional and legislative frameworks and there was a need to rethink and refine policy and practice regarding disability at an institutional level. This involved clarifying entrance requirements; identifying barriers to access; informing students/applicants of facilities, resources and services; engaging in teaching modifications, raising staff awareness, and promoting relevant staff training and professional development.

Students with disabilities and their use of technology are of particular interest to academics worldwide. Of course, universities do pay attention to the needs of 'disabled' university students – including their technological needs (Seale, 2013a). One reason for this is that technology is seen as a tool for attracting to higher education students with disabilities (Ball, 2009, cited in Seale, 2013a). However, Seale goes on to state that universities have an interest in 'disabled' students because they are told they should, and because they can make money from selling themselves to them and their needs (Foley, 2003). Therefore, Seale (2013a) argues that "there is little acknowledgement that universities might be genuinely interested in the technology skills and experiences of their disabled students" (p. 257).

One factor which arises from research in this area is that disabled students are often viewed as "oppressed victims of their universities, who are deprived of equitable access to important learning resources as a result of institutional noncompliance with legal requirements or technical standards" (Steyaert, 2005, as cited in Seale, 2013a, p. 257).

The relationship between 'disabled' students and universities is mostly negative, Seale continues. This relationship is characterized by,

> poor location of publicly available computing facilities and lack of specialised software (Fuller, Bradley & Healey 2004); frustrations with the bureaucracy and speed of the funding and assessment procedures for obtaining assistive technologies (ATs) (Goode 2007); and lack of support or training to enable disabled learners to become 'fluent users' of ATs" (Shevlin, Kenny, and Mcneela, 2004) (all cited in Seale, 2013a, p 257).

In regard to issues in the provision of resources for disabled students, Hadjikakou and Hartas (2008) named many, including variability in the provision across institutions; a lack of trained tutors; and limited awareness of issues related to assessment and identification.

i) Philanthropic organizations' provision

Many of the students received their first computers from philanthropic organizations. These students and others also learned how to operate digital devices such as computers and smart phones, as well as how to use special software, from the training programs of these philanthropic organizations. They found this to be extremely helpful and empowering.

Other students, however, were more critical, but many of their criticisms seemed to relate to a desire to emphasize their need to be self-motivated, and 'normal', and not have to rely on outside organizations to support them.

Outside organizations such as the *Sightsavers* approached the university to offer facilities for students with visual impairments, and the university accepted this offer. However, years later it was considered that this event was more an example of disempowering. The *Sightsavers* cooperated in providing facilities but these facilities were not updated or maintained, and in many cases they were not appropriate and the students did not use them. Eventually the university provided qualified staff but not improved resources, and the students claimed the whole situation was one of neglect.

Overall, the research participants had criticisms of the provision of facilities by philanthropic organizations – as did Singh and Sethi in their study in India (2012) – but they also had appreciation for some of them such as those provided by the Visually Impaired Peoples' Society (VIPS) and the Physically-challenged Development Foundation (PDF). Some of the positive support they felt they received from philanthropic organizations included: provision of devices and software and a Voice Bank service: IT training; information and assistance on asserting their rights (including lobbying and advocacy); assistance in eliminating barriers to receiving banking services; raising funds for scholarships; motivational seminars; career counselling and the provision of job searching skills. These led to increased communication skills, increased interaction with other students and the development of technological skills almost equal to the skills of non-disabled students.

ii) The students' own provisions

The support from numerous philanthropical organizations mentioned above was varied and sometimes extensive. The students' own provisions – primarily helping each other – was not so extensive. However, the students did support each other and seemed to take pride in doing so – a further step toward their independence and toward a feeling of being 'normal'. This helping of each other also developed some leadership skills and experience in some of the students.

Overall, in this sub-section on the provision of technology, although the students sought independence – they also wanted empowerment of the kind that was provided through the generosity of other organizations. Further to this, this section points again to the need for the

'disabled' to be given greater control over specifying appropriate steps to meet their own needs.

9.2.4 Outcomes of digital technology use

This section relates directly to the fourth research question:

> How do students with disabilities perceive the outcomes/consequences of their digital technology use at university? In what ways do students feel (dis)advantaged and (dis)empowered by their use of technology?

9.2.4.1 Achieving self-dependency

The number one aim of the students seemed to be freedom from dependency. These students were lost without their digital technology devices. But now, with them – for example screen reader software – the students who could not read print now had an alternative means of gathering the information they needed.

Self-dependency is clearly the number one desired outcome stemming from the chapter on the outcomes of digital technology use. The students spoke of being self-dependent and self-reliant and of computers and specialized software liberating them from dependency on others. The statements above reflect the views of all the students who participated in this research. Some may speak of 'self-reliance', while others use the terms 'self-dependence' or simply independent', but they are all speaking of the same thing. They are speaking about having the freedom to do what is needed to realise their potential. Of course, in detail this means having access to the resources they need, and this includes both material and financial resources. Keyes et al. (2015) state that the Social Model traditionally sees independence as the means to empowerment. They believe however (and they claim that other theorists such as Tronto, 1993; Kittay, Jennings & Wasunna, 2005, have similar views) that empowerment actually comes through care. In advocating empowerment for the 'disabled' Keyes et al. (2015) promote care over self-sufficiency. However, they do promote self-determinacy also, and see independence as being characterized by self-determinacy, rather than just self-sufficiency.

Using the screen reader was found significant in this regard, with many of the participating students (those with a visual impairment) stating that the screen reader has given them much more independence. Keyes et al. (2015) view the 'autonomy' of the Social Model as needing to be redefined as 'relational autonomy'. It is their belief from their studies that

'interdependent caring relationships' (p. 240) pave the way to empowerment, while self-determinacy leads to independence.

Keyes et al. (2015) shed light on the contradiction that it is not enough for those with impairments to have the resources they need, or interdependent relationships, but that they also need to have sufficient control over these resources. Thus, their recommended pathway – based on the Social Model – is for independence through self-determinacy. More importantly in their research, they point to empowerment through care.

9.2.4.2 Access to information and resources

In many cases the students, particularly those who were visually impaired, lacked information. Even finding out what time of day it was raised difficulties. Access to digital technologies helped diminish this problem, but it was not totally eliminated. Before the participants in this research gained significant access to digital technologies they were very much dependent on others. Now, with the introduction of this technology their situation improved dramatically. But it could be better!

Some stressed that it was not just the devices they used which gave them more independence, but it was also the access to the internet which helped to empower them. The internet was particularly helpful in filling the gaps in their knowledge. Access to information played a significant role in eliminating dependency. It was so significant that some students said it connected them to the whole world. This clearly highlights the empowerment they experienced from using the internet.

Access to various resources overall played an enabling role in the lives of the students surveyed. These results tally with the research of others. In their large-scale study funded by the EU of 15 higher education students with impairments, Hadjikakou and Hartas (2008), in the Cypriot context, report that "access and provision in higher education is limited" (p. 103). They state that provision is complex and raises many issues and quote a Scottish study by Tinklin and Hall (1999) which revealed that the significance of provision for students with disabilities in higher education "depends on attitudes, experience and awareness about disability among staff and students, rather than the institutional policies alone" (Hadjikakou & Hartas, 2007, p. 105, citing Tinklin & Hall, 1999).

Hadjikakou and Hartas (2007) found many instances of lack of provision in their research, including the belief of students with disabilities that "students with disabilities are not

welcomed at the institution" (p. 109), and there were few trained staff, inadequate financial supports and insufficient teaching modifications, among other limiting factors.

9.2.4.3 Less social isolation

In many disciplines theorists write of the consequences of social isolation. For example, social isolation can exacerbate some medical conditions and impairments, such as schizophrenia (Mithen et al., 2015). In regard to the dangers of social isolation among 'disabled' higher education students, Low (1996) adds that,

> Another problem faced by students with visual and mobility impairments as they negotiate the campus environment is isolation. This isolation occurs on two levels, one subjective and one objective. On one level isolation is individually and subjectively perceived by students with disabilities *(p. 239).*

And the second level is when:

> students with disabilities are isolated in an objective sense when they are seen by others going in special doors, and in situations where they feel disorientated, unsafe and afraid. They are seen as moving slower and in situations where they have to ask for help *(Low, 1996, p. 240).*

In regard to the students researched in this current study, social isolation was not found to be a significant factor, possibly because, being reasonably successful students, their competence was recognized by others, which smoothed interactions. In fact, in these students' lives there was an expansion of social networks through online groups and communicating through the internet. Where the students were once alone in their lives, now, as members of online groups for academic issues – thanks to the internet – they are able to communicate regularly with other students. This not only helps them in their studies, but it creates systems of communication with others that were not previously there. This has led to improved social skills and less social isolation.

Now, while the students have more scope in their lives for meeting their own needs through the development of technological skills and practices – they are also developing self-confidence. Their self-confidence and sense of dignity have increased. The Social Model of disability advocates a social system where everybody can participate without shame, discrimination or limitation. The internet, particularly through social media, enables this. It

allows equal participation as the students are not required to disclose their identity as 'disabled' on digital social platforms.

Technology has connected the students and teachers to resources as well as to each other, and all this leads to a feeling of empowerment. This finding supports research by authors such as Selwyn et al. (2017). The students now have more control – more power in their lives – and therefore more independence. However, this is still not enough. Their struggle for empowerment and independence is ongoing, and the Social Model of disability helps explain why.

9.3 Overriding themes

The analysis of these data presented some high frequency issues which underpin and connect to the theoretical model presented earlier. Therefore, the ensuing discussion draws on the emerging themes to enrich the discussions and therefore move forwards towards the contribution of this research work to relevant theories.

The main themes that have emerged from the analysis of this research are:

- Disability as a social construct.

- Social capital as a resource.

- Empowerment versus disempowerment.

- Inequity and social oppression.

- Conflicting identity: the dichotomy between students' needs to be acknowledged as having special needs, and their need to be independent and self-empowered.

- Relevance of the Social Model of disability.

What is apparent from this research is that the issue of disempowerment versus empowerment is very relevant to the students with disabilities. They were constantly seeking more independence – more empowerment – and confronting to oppose factors which worked against this. Yes, they were empowered – to some extent. But they were not as empowered as they wanted to be. It is not just a matter of obtaining resources (or more appropriate resources) or needing more support. It is not just a case of these students needing more social capital, or more consideration. There is another factor at play. This seems to be the fact that these students – without exception – did not feel 'normal', and they wanted to.

9.3.1 Disability as a social construct

This research presents a unique opportunity to look beyond the medical model of disability and therefore uncover the social interactions and framing of the tag 'disability'. The literature review presents a dilemma around the theoretical consideration between 'impairment' and 'disability' which was also quite visible in the analysis of data. The realization of the challenges faced by the challenged students and the social perceptions around them often narrow down the path and create an opportunity gap between the so called 'normal' and 'disabled' students as was apparent in the findings.

This research is focused on the technology utilization by the challenged students. The students' responses in the data analysis chapter, especially in Chapter Six, are quite self-evident in presenting how social norms and beliefs block the engagement of the student with disability in effective learning and in building profound social relations beyond dependency.

> *The social model ... does not deny the problem of disability but locates it squarely within society. It is not individual limitations, of whatever kind, which are the cause of the problem but society's failure to provide appropriate services and adequately ensure the needs of disabled people are taken fully into account in its social organization* (Rapley, 2004, p. 62, citing Oliver, 1996).

As the analysis presented, the participants of this research do not want the stigma of being 'disabled', and they perceive the challenges as the limitation in the systems and lack of resources to support their needs. For example, as Ahmed said, the computer labs do not have screen readers installed which limits their capacity to learn what was taught in the class and restricts them from achieving their learning competencies. If the institute could overcome that limitation, they would learn like 'normal' students. These findings resonate with the findings of Wendell (1996, p. 30, cited in Ellis & Kent, 2011) regarding how the society often devalues the technologies used by the disabled and the adjustments disabled people make, and it stigmatises their technologies and treats them as helpless or dependent for using them. Ideally, in a world envisioned by the respondents of this research, it is not the impairment of individuals but the limitations of the systems and the perspectives of the society which makes

them dependent and disables towards functioning normally. This is an illustration of the social model's imposition of 'disability' as a 'social construct'. Moreover, the theoretical underpinning supports the findings of this research, namely that the impaired or challenges students could achieve their goals just as the 'normal' students if they were provided with necessary technological, social and financial provisions and if they were not stigmatized. Similar findings were portrayed by Anastasiou and Kaufman (2013) who stated that 'disability' is now viewed by many as a social construct, and this viewpoint is a major component of the Social Model of disability, which states that people with impairments have been 'disabled' by society and by their disability they are set apart because they are not 'normal'.

The focus of discussion emerging from the analysis is two-fold – labelling and limiting. If and when the social perception labels a group of people as disabled because of their impairment, the need for segregated and specialized provisions arises and so does the discussion for inclusion. It is as if the social segregation were initially created to permit the discussion of inclusion later on. As people with a disability too often find that their initial means of identification is 'disabled' (Galvin, 2005 cited in Scullion, 2010), it separates them from others and therefore, often, their needs and requirements are also separated from those of others. Telford et al. 2006 (cited in Scullion, 2010) also states that this has a powerful impact on a person's self-image and traps people with disabilities within the perception that they have a problem (Galvin, 2005 as in Scullion, 2010). This way of perceiving people with impairments devalues them on the basis of their disability status, denies uniqueness and ostracises those who are not 'normal' (Scullion, 2010). Then, in order to support them and make the learning environment inclusive, the social structures, such as the institutions, need to make necessary policies and provisions, and to allocate budget and resources. Can all these be minimized by not segregating them in the first place? – the question remains.

The Social Model of disability, in succeeding the Medical Model, paints a more empowering picture of those with disabilities, a picture in which they are not 'abnormal' but different, as we are all different to each other. This resonates with the voices of the respondents of this research. Oliver (1996) points out that it is not individual limitations which is the problem, but society's failure to provide appropriate services, while Clark (2000) states that it is the barriers in the outside world (including barriers of attitude); similar results have been found in this study.

The situation as posed by respondents, is created as a result of considering the physically challenged population beyond normal and therefore seeing the need to create a specialized and separate system for supporting them. This could be minimized if their impairments were considered as some among many other kinds of impairment and efforts were made to create an integrated system rather than a parallel one to address students' needs. 'Disability' is clearly a social construct.

The perception of the social norms of 'normal' has been featured through all learning activities including classes and daily activities. From the infrastructure to services, the academic process has been designed to exclude those with disability, and the response to the perceived needs of students with disability has led to the provision of a separate service and arrangements, which the higher education institutes are trying now. Even though the situation is changing slowly, which is enabling the disabled to access more, because of the social norms of their difference they are still ostracized and often have few choices to make. This forces them to see disabilities as limitations – because they just do not fit in that established system. Terzi (2004) sees 'disability' as more a problem of society than of the individual, while Shakespeare (2006) sees the Social Model as revealing that the problems of disabled people result from social oppression and exclusion, rather than their own deficits.

The labelling of people with impairments as being disabled causes social oppression (Anastasiou & Kauffman, 2013). Barnes (2013), speaking from personal experience and research, states that those with an "accredited impairment are disabled by an unjust and uncaring society" (p. 12). The current research where the research participants portray a university situation where they are constantly seeking greater independence and empowerment supports this. Anastasiou and Kauffman (2013) point out (as many others have) that 'impairment' is the valid term in referring to what is often termed 'disability' (with impairment referring to the loss or lack of some functioning part of the body). Disability, on the other hand, really refers to "a society that discriminates, disadvantages, and excludes people with impairments, as it does not make appropriate accommodations and gives preference to those without impairment" (pp. 444-445).

From the literature review it was clear that, despite the social model presenting this issue as wrongly perceived, social norms prevail based on medical theories which point out limitations. However, what is unclear is the extent to which technologies can enable the challenged population to perform independently and to integrate within the social culture – at campus and in personal/professional life. The respondents see the technological means as

their enablers yet the hardware and software provisions must improve to strengthen their access and capacity. Besides, the respondents firmly believe, if they can perform independently, the understanding of disability in the society will be changed. That surely demands rethinking disability. The findings show how social constructs of disability can change, just as many scholars have argued (Anastasiou & Kaufman, 2013).

Despite the influence of the Social Model of disability (Vicente & Lopez, 2010) the system needs more drastic changes. For proper inclusion, many of the interviewed students stated that they did not want additional assistance to get over their limitations; rather they expected appropriate technological support towards becoming self-dependent. However, that alone would not eliminate the social perceptions that alienate them from others. It seems from the findings that what disabled people need is a society that reminds all that everyone has limitations, everyone needs support – and everyone is unique. This is supported by numerous researchers including Scullion (2010) who states that researchers are now seeing the medical perspectives of disability as themselves being 'disabling', alienating and promoting discrimination, which infiltrates all spheres of a person's life. Thus we have viewpoints such as those by Shakespeare (2006) who frequently refers to the historical oppression and exclusion of disabled people.

This aspect of the findings demands scholarly attention as well as further research regarding how and to what extent this issue can be addressed through changing social norms and understandings of disability. In addition to further research, surely this demands immediate changes at policy, program and practice level in the higher education institutions. It is also important to note that, although some of the relevant literature appears to be saying that 'disability' is nothing but a construct, it is still necessary to acknowledge that a 'disabled' person's 'impairments' are real, and their learning need to be supported via enriched social capital involving better technologies and social structures and resources (Anastasiou & Kaufman, 2013).

9.3.2 Social capital as a resource

In the analysis of this study, it was clear how important social capital was in the lives of the student with disability in higher education in Bangladesh, since participants repeatedly pointed out how they manage to engage in their everyday life with the support from the

seniors and non-disabled students. For example, one of the respondents, Tamanna (see Section 6.2.1 of this dissertation) stated –

> *My sighted class mates helped me to put my phone recorder on the teachers'*
> *desk. That helped me to get clearer audio of the lectures. Some of them were so*
> *passionate for me that if my phone did not have sufficient battery charge they*
> *[would] lend their phones to record the lecture and supplied me the recorded*
> *audio file in a pen-drive so that I could transfer the lecture into my device.*

This clearly depicts the resourcefulness of these informal supports and also presents how the students with disability are utilizing these resources. However, emphasis must be placed on 'why' and 'how' these supports become available and, most importantly, how these supports can bring equity and inclusiveness to all in the higher education platform.

The formation of social relations, which is often linked to the cultural contexts and practices, is a need for students with disability and they keenly explore it as we have seen in the analysis. They eagerly connect and reach out to their seniors and peers making active efforts towards building the relationships they can utilize later on. These social relationships not only help them to cope with the new environment and process, but also, most importantly, support them in technology access and utilization.

The student participants of this research had social capital in many forms, as found in the analysis, and in most cases the support from family, friends, peers and senior students helped them integrate with so called 'normality' and participate academically via assistive technologies. The findings of this study indicate that the disabled students' technology experiences were significantly shaped and enriched by their social capital – the "aggregate of actual or potential resources" in an individual's social network comprising their family, classmates, friends and so on (Bourdieu, 1997, p. 744). However, the presentation in this study is a snapshot from the high achievers among the nationwide students with disability. The students who do not have or cannot access these social resources, cannot progress this far as echoed in the voices of the respondents. This not only presents the vital need for this support, but also ratifies that these social resources are 'capital' which enable the disabled students to build further, to continue and achieve. As Bourdieu (1986) pointed out, students with less social capital experience difficulties in many areas, however, in reality the situation is worse

The Social Model of disability theory explains that a lack of social capital leads to a situation where the disabled students feel disadvantaged (Mithen et al., 2015) and too dependent to function in daily life. However, the ten student participants have shown that their social capital has been significantly beneficial in enabling them to achieve in life.

Like economic capital, social capital often acts as an income 'bank' of empowerment for underrepresented people (Morosanu et al., 2010) which opens doors for required support from the development organizations or elsewhere. The most significant application of social capital this study found was actually in the area of access and utilization of technology for higher education. It has also been seen that technology empowers the students towards being elevated beyond the impairments and integrating into both academic and post-academic life, which resonates with the findings from Finkelstein (1980) and Oliver (1996).

In that context, Trainor (2008) argues that social capital (alongside cultural capital) is an important component in viewing the post-secondary transition of students with disabilities to universities. Social capital may be a resource for communities or for individuals. It may include financial or academic means and it may include confidence. But a major element of social capital is also group membership. Most of the students of this research had social capital attached to their families and online support groups.

Chenoweth and Stehlik (2004) suggest that 'social capital' was originally used to refer to the capacity of strong communities and families to support weaker communities, individuals and families. These authors define social capital as originally referring to and including the resources of wealth, property, equipment, knowledge and skills, and cultural values. Now, after the turn of the century, they see social capital more as the property of groups, as something of value to be used for "the exchange of resources or supports or services" (Chenoweth & Stehlik, 2004, p. 62). They also state that social capital has various dimensions – that it involves participation, reciprocity, trust, social norms, common resources, pro-activity, and tolerance of diversity. Mithen, et al., (2015) extend our understanding of social capital further, stating that it is a resource that "flows to individuals from their membership of social networks" (p. 26). Similar findings were revealed in this study as social capital often helped them to connect with the online groups and on-call help seeking opportunities. These findings clearly establish the relationship, which has been supported in the above-mentioned literatures, whereby this social capital plays the role of vital resources enabling students with disability to access technology uses, which in turn lead to the path of self-dependency and empowerment.

Now, as a resource, social capital enables the students to avail different types of access towards achieving success in their academic life. It also supports their mental health and strengthens their determination to become independent. For example, the University of Dhaka might not provide training, but other organizations do, and referrals often offer a way to access such training. Online groups do not just assist in helping students socially but also support building stronger networks among the students with disability and therefore strengthen peer support. The scope of the peer support reaches beyond the academic arena to personal and potential professional life. People with impairments or disabilities are disadvantaged – whether they are students or not – as they tend to be at a socioeconomic disadvantage, with unemployment and a lower level of education (Mithen, et al., 2015). As the analysis depicted the influences of the social relationships and capital as valuable resources for the student with disability within and far beyond academic life, the students, clearly, understood their significance and therefore made proactive efforts to build these forms of social capital.

Athough the data present the potential of social capital, that is neither is enough nor does it guarantee the desired success for the student with disability. For example, from a study of 31 'disabled' students at a university in the UK, Seale (2013a) states that the capital of students (social and cultural) is strong, but not strong enough to enable students to fully benefit from technologies. She also states that digital capital is not enough to guarantee complete inclusion into university life. This was also echoed in this study, as despite having strong social relationships and resourceful social capital, the disabled students often faced many challenges. As Seale (2013a) pointed out, the encouragement of family and friends was a factor in determining their persistence in trying to master their use of relevant technologies at university, yet it did not provide the technological supports needed by those students. In the context of this research, in cases where the students received necessary hardware supports from family, they still had to depend on the peer groups (or senior disabled students with similar impairments) to learn about and to access the software and platforms. In combination, those supports can present the opportunity of maximum benefits, however, the rarity of that event presents the need for institutional and uniform support mechanisms. As resources, the social capital enables the students to various degrees but it does not create a support package that would provide equal opportunity for all of the disabled students. This creates a disparity among the disabled students as if the access and opportunities depend on the amount of social capital they have.

Another argument which should be part of this discussion is the disparity among the disabled and non-disabled students in acquiring social capital. Researchers have found a negative correlation between social capital and being 'disabled'. In their research, in the context of Australia, Mithen et al. (2015) found that people with 'disabilities' have lower social capital (McPhedran, 2010, cited in Mithen et al., 2015). They also found that in some settings people with 'disabilities' had less participation and were less likely to receive help from others (such as family, friends and neighbours). Moreover, Lippold and Burns (2009, cited in Mithen et al., 2015) found that people with disabilities have smaller social networks; less direct contact with family and friends; less ties with organizations; less social support; and less financial support, compared to people with no disability. One of their principal findings was that people with 'disabilities' have lower social capital.

Papasotiriou and Windle's (2012) research indicated that limited social contacts at university led to less social capital. These authors studied the social experiences of physically disabled Australian students. They found that physically disabled students have weak social attachments at university, and they refer to physically impaired students as being 'disabled' by universities. They stress the link between relationships and social capital and explain that, "people with access to social capital gain access to economic resources and can increase their cultural capital" (p. 937). As stated by Bourdieu (1986) in his elaboration of social capital theory, knowledge and information achieved through social networks can be used to assist students in making important decisions during their time in higher education.

And, that brings the discussion to the next agenda – the process of empowerment for the student with disability. More importantly, the discussion should proceed towards reducing the capital gap among the so called normal and disabled students. Though it is unclear whether having poor social capital is always linked with disability, the evidence shows that disabled students with higher social capital display better confidence, skill sets and tend to be more successful as they felt comparatively more empowered.

9.3.3 Empowerment versus disempowerment

The analysis presented a scenario conflicting with the general presumption that technology always has a positive impact on life. For disabled students, depending on their context and situation, technologies create some unique sets of challenges. Despite the double face of

technological provisions, the respondents actually positioned themselves strongly in favour of technology uses as their experiences suggested that the technologies made them independent or self-dependent, if not fully, at least mostly. Nevertheless, the achievement of self-dependency with the support of technologies often starts with a choice made by others, and this leads us to the issue of empowerment and its counterpart, disempowerment, which may determine the path for disabled students.

As stated earlier, Keyes et al. (2015) have discussed empowerment from various perspectives. Their understanding – from their interpretation of the Social Model of disability – sheds insights and provides a coherent understanding of the connection between care, interdependency, self-determinacy, independence and empowerment, in relation to the needs of disabled students undertaking higher education studies. The following figure is about pathways to empowerment, based on the findings of this research and the findings of Keyes et al. (2015).

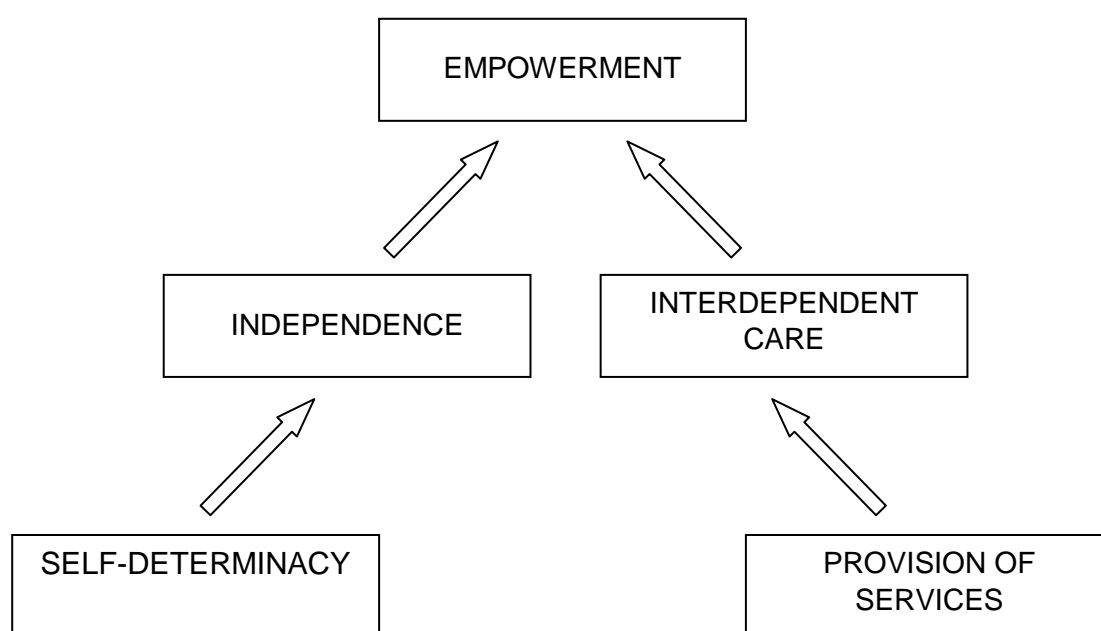Figure 4: The pathway to empowerment[3]

Disability as disempowerment remain the subtle theme throughout the cases and there are several aspects of it, as reported. For example, the lethargy in responding to their (disabled

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[3] - explains in a simplified way, this research's recommended pathway to empowerment for disabled students (based in part also on the research of Keyes et al., 2015).

students) request or needs by the authorities is one aspect, whereas, considering them as slower, weaker and will not be able to participate fully like peers is another aspect. Both these factors combine in disempowering the disabled students as also observed at case of young peoples' educational decision making (Rose and Shevlin, 2004). As Rose and Shevlin (2004) illustrate how the marginalized people and their families become unsuccessful in effectively influencing the structural changes and the provision of services despite having legitimate concerns. Given that the 'provision of services' is a key component for empowerment, the failure to influence it to accommodate the need of disabled people can lead to disempowerment. As this research presented, despite the disabled students expressing concerns (e.g.- necessity of installed software at computer class) that has been recorded in several case studies, necessary actions weren't taken always which surely is a challenge for them. In this context, the technologies play a dual role – enablers and challenge-poser. For example, on the one hand, the respondents presented technology as a means of empowerment while on the other hand, they complained that they were forced to use the devices they had been provided, the pirated software etc. This dilemma itself presents the necessity of deeper investigation; however, for now in the context of this study, it seems that further improvement of systems and provisions needed to be made towards ensuring empowerment through technology.

In order to better specify these conflicts, the discussion takes up several themes. Firstly, empowerment can be promoted by ensuring independence (French & Swain, 2011) not only in terms of functionality but also in terms of choices made. The case of Nazat presents the narrower scope of technology utilization, as she gave up embracing a newer technology (iPhone) because of her disability. The same applied for Humayan (Section 5.2). Another respondent, Selim, was not allowed to use his android phone and Iftikhar was forced to use the laptop provided by an NGO which was not at all convenient for him because of its size and weight. Though choices made by others were imposed on the respondents, they nevertheless felt that these devices empowered them greatly. From a scholarly perspective, it is questionable whether independence was genuinely achieved. Empowerment involves seeing people as interdependent, and exploring individual needs (Keyes et al., 2015) as illustrated in the words of the participants of this research, who sought to have their individual technology needs met. In deeper conversation with the participants, they described seeing those issues of lack of choice as challenges and as factors in narrowing their ways of achieving self-dependency.

Secondly, the software and programs used by the students were mostly suggested and introduced by the seniors. Since the disabled students could not explore the better or other options without help and since there was no structured institutional support service, they were often compelled to use them rather than making choices based on their own priorities. Again, most of the software was pirated, since there were no provision for university supplied software. Though the students with disability desperately needed to use technologies and software to be self-dependent, because of the lack of counselling provisions or institutional guidance, the students had to seek help from others. This dependency sparked the feeling of disempowerment as found in the analysis of comments among the students with disability.

Thirdly, dependency and lack of institutional guidance often stems from some underlying social oppression. Indeed, much scholarly discussion presents 'disability' as social oppression (Barnes & Mercer, 2010). Given that this study found there was a need for service initiatives to break down barriers to societal inclusion, changing the overall social lens towards disability could affect the empowerment issue significantly. By seeing 'disability' as social oppression, Social Model theorists point to the need to view the plight of the 'disabled' as much greater than a need for self-determinacy, or care or the provision of services. That lens sees empowerment as stemming from a need for a different perspective of the 'disabled', a view that empowers them rather than endorsing 'not-normal'. Students themselves do not want to be seen as different or abnormal. Many studies support the view that students do not necessarily like to see themselves as disabled. For example, students in a study by Brewster (2014, p. 16) wanted to see a 'less polarized view' of students as either having or not having an impairment. Keyes et al., 2015 refer to empowerment as a result of deprivation and the lens society uses to differentiate them from the normal. Therefore, empowerment should not be considered as a luxury or just a desire, but as a key issue in reducing the challenges that disabled people face (pp. 236-237) in their everyday life. This resonates with the findings of this research as through increased technology use many respondents overcame the tag 'different' imposed on them by society.

However, while analysing respondents' suggestions for their empowerment, the study found that support focussed on their needs and care could make a bigger difference as Keyes et al. (2015) pointed out that strengthening social relationships and 'empowerment through care' are vital (p. 238) (see also Shakespeare, 2006). Without 'care', processes intended as empowering may become disempowering (Keyes et al., 2015). Scott and Doughty (2012),

however, pointed out that the concept of 'care' has negative connotations within the disability movement, with the focus instead being on empowerment through choice and control, particularly within what they call the 'peer-support' movement. However, the argument stands on (from a feminist perspective) the notion "that 'care' – in the sense of caring about, rather than caring for – should be seen as fundamental within peer support" (p. 1011). Scott and Doughty also prefer the concept of "responsibility towards" rather than "responsibility for". They accept that this 'care' does involve some interdependence, but that although they are seeking independence, some people with disabilities also want and need this care.

In regard to empowerment, and as illustrated in Figure 4, the argument that everybody is sometimes dependent has been seen as deeply problematic within the disability movement. One reason for this is that in practice, "people with disabilities tend to be seen as the dependents" (Scott & Doughty, 2012, p. 1018), and choice and control are taken away from them. However, the authors argue that within the peer-support movement, "people are extremely conscious of the dangers of this slippage from care into dependence" (p. 1018). In this context, the care of the seniors can be translated into dependencies if not addressed institutionally with a formal or semi-formal support service mechanism. As stated throughout this thesis, the respondents recognized the tension between wanting care (for them this primarily involved aid in having their technology needs met), and in wanting independence.

Morris (1997) argues against the notion of care, stating that people who need support in their daily lives have been constructed as dependent people. Instead, she states that caring is a form of oppression. She prefers the notions of choice and control, stating that caring assumes the person being cared for is unable to exert choice and control. The use of the terms 'carer' and 'dependent' seem to reinforce this viewpoint (Morris, 1997). The participants of this present research would certainly prefer the ideas of Scott and Doughty (2012). Yes, they want empowerment – but they also want care and a welcoming environment to avail themselves of assistance for their short-term needs.

Lastly, the research participants mentioned the importance of their own community supports as they support themselves in many situations. Despite the fact that they often did not meet physically, technology (online groups, phone calls, and so on) helped them to stay strongly connected. Various authors, including Papasotiriou and Windle (2012), stressed the importance of relationships as a means of social capital and thus empowerment for the 'disabled'. In discussing 'care' as a means to empowerment, Keyes et al. (2015) also spoke of relationships as a means of support and empowerment. Farmer et al. (2002), cited in

Hadjikakou and Hartas (2008) refer to this when they state that three levels of participation and provision should be considered for students with learning difficulties, the first of which is the personal level including all relationships. The success of the student with disability often depends on the care and support from family and the closest ones and then, at the academic level, the sharing among themselves can make a notable difference, as this study found.

However, in the discussion of empowerment, scholarly debates emerged on who should bear the responsibilities – the people with or without impairments. Keyes et al. (2015) remind us that the services for those with impairments must be controlled by those with impairments. However, like Shakespeare (2006), Keyes et al (2015) also stressed that people accessing services should be empowered enough to manage those services.

Dempsey and Foreman (1997) see empowerment as a psychological construct and prefer to see it viewed as an ideal aimed for through the provision of services. This is useful, of course, but in the minds of those researched in the present thesis, it is only a step on the way to empowerment. However, it is apparent that a package of changes is required to fully empower disabled students and that can bring changes in students' perspectives too so that they will not feel less- or dis-empowered in the first place.

As stated above, care should not create dependencies, but care is still needed for people with disabilities, just as we all need care. However, it is worth noting once more that we are referring to 'caring about' rather than 'caring for' (Scott & Doughty, 2012). As stated elsewhere, the participants of this present research want 'care' but within the context of an overall change within society that will change both their own and others' views of 'disability'. This defines 'caring about' as opposed to 'caring for' (Fox, 1995; Morris, 1997).

Selwyn et al. (2017) quote Galloway (2012) as saying, "one should not focus so much on devices or apparatuses as such [but] more on the physical systems of power they mobilize" (Selwyn et al, 2017, p. 169). Thus, it is in becoming more empowered that 'disabled' people will be more likely to see themselves as 'normal' members of society. Finally, in reiterating the content of Figure 4: self-determinacy, interdependent care, the provision of services and independence are all key factors necessary for empowerment. These factors will all need to be addressed in order to oppose the disempowerment which the Social Model attributes to social oppression (Barnes & Mercer, 2010; Keyes et al., 2015; Shakespeare, 2006).

9.3.4 Inequity and social oppression

Oppression, discussed briefly in the previous section, can be better understood by taking account of the social stigma and the society's perspective of seeing disability as 'different'. As found in the analysis, the continuous struggle of the students with disability to gain expertise with technologies is likely to be generated from that silent culture of dependency and difference. This, in turn, leads to disempowerment which the student participants of this research felt, and from many sources, as evident by their comments.

The inequality has been observed, in this study, in terms of access and utilization of the technologies. For example, the lack of software in the computer lab is nothing but evidence of negligence which would not happen for the so-called normal students. Being socially oppressed, the voices of the disabled are often ignored and overlooked, their needs remaining unmet despite the available resources as observed in the case of the Braille printer.

As Abberley (1987) stated, "a social theory of disability can best be developed through the use of the concept of oppression" (p. 7). The transformation required to address the needs of the student with disability wasn't challenged by lack of resources but because of poor management, lack of will power and actions by the administration and by the failure to provide the opportunity to have a balanced dialogue among the oppressed and oppressor.

As Watson (2002) suggested a shift in culture is required for authentic changes, which also echoes Abberley's (1987) argument. Social oppression can stem from various aspects of low social capital including isolation, a lack of resources ranging from financial to technological, and also from feelings of dependency and being not 'normal' or accepted. Basically, social oppression stems from not being able to meet one's own needs while others around you have greater independency and power, but it also comes from the perception of others. As with all aspects of a 'disabled' person's needs, however, oppression stems from living in a society where the design of that society stifles the freedoms of 'disabled' people (Watson, 2002). Consequently, a shift in thinking is needed for not mere acceptance but for effective inclusion (Watson, 2002). The students studied in this research were found to have relatively high social capital, which has aided them considerably in accessing higher education. However, in contrast, those who have less social capital generally will not achieve the same or experience the same inclusion in society. Chenoweth and Stehlik (2004) state that many people with disabilities and their families are socially isolated, with a reduced capacity to form networks. They say that social capital is low for vulnerable people who are seen as different, such as those with physical impairments.

Increasing the inclusion of the 'disabled', and increasing their social capital, is clearly a directive which will help eliminate social oppression. Chenoweth and Stehlik (2004) support this in stating that at the turn of the millennium, in considering the needs of 'disabled' people, the inclusion of people with disabilities (as a means of fighting inequity and social oppression) has been of major interest in education. They stress that they are not talking about a need for integration where 'disabled people are made to fit into the mainstream' (p. 60); rather, they are referring to an inclusiveness which does not require conformity or assimilation, but which embraces diversity. So, the arguments in the context of this research should be whether these disabled students are to be seen as just some among many diverse students, and whether the institute has the authentic intention of ensuring successful inclusion, which is a manifestation of human rights implementation.

Throughout the literature it is claimed that the Social Model of disability proponents see disability as a problem of society, not the individual. This resonates with the findings of this research as the respondents view themselves as normal people with different needs which can be addressed with better technologies. The respondents even supported their view with the self-dependency achieved with the support from technology. However, instead of society seeing the disabled as having 'impairments' and restructuring itself to cater to them as they decently (hopefully) cater to all other minority or disadvantaged groups, they feel they are shoved aside. For example, when Nazat (a visually impaired student) asked for an internet connection, the residence supervisor made some indecent comments (indicating that she wants to check out adult stuff) which is ironic given she is visually impaired. Another male visually impaired student was allocated a room on the 5th floor with limited access to lifts. These examples underpin the softer forms of oppression and the mindset that leads to them, which are often ignored. Again, 'reasons' abound: "not enough funding." "We don't know what their special needs are." "There are too many other pressing concerns." "Society is structured for 'normal' people – the rest just have to fend for themselves". This is social oppression. Yet, as stated by Chenoweth and Stehlik (2004) social oppression is still strong and those among us with disabilities are still struggling. Watson (2002, p. 512) summarises Barnes (1991) stating, "Disabled people share one important attribute; they are all made the subject of oppression".

9.3.5 Conflicting identity

This research has revealed an interesting finding – the opportunist behaviour of the disabled students. On one hand the student with disability, who participated in this study, want greater access and resources as they have special needs compared the normal students along with continuous support from institutes, academic and administrative staff and peers. On the other hand, they like to consider themselves as normal in different contexts, especially at social representations. This conflicting behaviour has been found in many others' research, such as that of Low (1996) and Watson (2002). It might be that this derives from students' life experiences as they found technology uses as enabler, but it also sometimes makes them more self-aware and differently branded due to their uses of different devices and software (Cranmer, 2017). The existence of this duality of personality surely requires further research to better understand it, though this is not uncommon among people with disability. Low (1996) speaks of disabled identities (where 'disabled' students seek assistance in many areas of their student life) and non-disabled identities (where they endeavour to appear normal in the physical environment of the university). Students must negotiate both, but their greatest desire is to be seen and treated as just another `normal' student. Low states that, "at odds with this process is that, at times, it becomes necessary for them to negotiate a disabled identity" (Low, 1996, p. 240). Low summarises the two identities described as both "interrelated and inherently contradictory" (Low, 1996, p. 246).

It can easily be argued that those students are benefitted to a certain level because of their disability as the admission requirement is far more flexible for them at University of Dhaka. However, whether from self-respect or ego, as it was not clear from the data, they would like to think of themselves as competitive winners. Not everyone who wants to go to university manages to achieve this privilege – disabled or otherwise. But these students firmly believe that they were more capable than their similarly disabled peers and as competitive and talented as their non-disable peers. This begs a scholarly argument, since there are neither clear guidelines at the University of Dhaka on the admission of students with disability nor any structured requirements.

In deeper discussion, many of the respondents, though agreed upon having somewhat conflicting identities, they preferred to take the opportunities which are entitled for disabled person only. The participants of this research had two contrasting identities. Sometimes they saw themselves as students without disabilities (when they thought/claimed that they were 'normal') and other times they saw themselves as students with disabilities (when they

required special provision/support from the university, for example, or when they criticized the lack of appropriate screen reader software in the computer labs in the university). This is typical of 'disabled' students, and even of disabled people generally and they keep shifting between identities in accordance with the potential benefits.

Agreeing with this, Low (1996) depicted how every day 'disabled' students are engaged in rejecting 'deviant' identities placed on them by others, but, "[at] the same time, they must take on deviant identities in order to successfully function as `normal' university students" (Low, 1996, p. 235). In their day-to-day activities at university, disabled students are stigmatized by their physical/environmental negotiation of campuses (they move slowly, they have special needs, they look afraid; they are seen as not being able to access certain environments). However, in an optimum environment their mental image of themselves, as found in the study, is more like that of non-disabled people with some minor limitations. Though this could be helpful for transforming society towards authentic inclusion, from the theoretical standpoint of this study, an important aspect of the Social Model is its emphasis on a positive disability identity. Nevertheless, according to Taylor (2005) many of persons with disability have rejected the idea of accepting a disability identity as they hoped or expected to recover sooner or later. Besides, many of Taylor's informants did not accept that having an identity as a disabled member of a larger community of persons with disabilities would be empowering, and even had very strong reactions to this, with one stating that, "the more you label yourself as disabled, the sicker and more dependent you will be" (Taylor, 2005; p. 503).

The student participants of this research struggled to see themselves as 'normal' and they believed society does not see them as 'normal'. Taking this one step further, they seemed to have had this drive to be 'normal' because they live in a society where they are not considered as 'normal', a society where their physical differences are considered as defects or limitations, limitations which are more significant than all the other differences between each of us, as opined by the respondents. Since self-identity is the product of a conscious action, the people with disability may need to be able to perceive themselves as different, but at the same time also as normal (Watson, 2002).

Watson (2002) states that many of his informants do not think of themselves as disabled, and that "… self-identity as a 'normal' person is achieved not through a side lining of impairment but through a restructuring of what is normality" (Watson, 2002, p. 519). Watson states that his informants "are merely downplaying the significance of their impairments as they seek to

access a mainstream identity" and that they push for their identity as non-disabled students (Watson, 2002, p. 525).

Low (1996) explored the experiences of nine 'disabled' students at McMaster University in Canada, and how they negotiated disabled and non-disabled identities on campus. On the one hand, these students rejected certain identities given to them by others, while at the same time accepting identities required to successfully undertake their studies. Low explains the difficulties raised by obstructions (people sitting with their legs out, bicycles chained to stair rails, etc.). The students' disabled identity is that part of them that pleads for help, for assistance because they have special needs as part of being 'disabled'. Their non-disabled identity is the one that is active when they want "to be seen and treated as just another 'normal' student" (p. 240). In addition, students use tactics to promote their non-disabled identities. These tactics include attempting to conceal their disabilities and avoiding confrontations (or 'connecting') (Low, 1996). Nonetheless, in the context of this study, the respondents' conflicting behaviours are not prominent, though they are still significant for discussion since this should be considered while developing a response strategy from an institutional perspective.

9.3.6 Reflecting on the relevance of the Social Model of disability

The students of this research were happy with their achievements but did not feel as though they were enough to be integrating into the society and to ensure competitive advantages. In broad lines, the Social Model theory supports the findings of this research, which point to the need for a system that provides independence for disabled students. The social model depicts the limitations of the system that provides limited opportunities to the different. The respondent, as the analysis presented, expects more provision of technology services, improved access and customized integrated arrangements to accommodate their needs, which resonates with the social model's framework. Their ambition for being normal with additional technological access stems from their belief that it is not they who have limited capability, but the systems that provide inadequate supports to meet their needs so they can realize their capabilities. This view of the participants endorses the Social Model of disability as not only the lens but also the approach that should be adopted to realize and to resolve the existing challenges for disabled students at HE.

The Social Model challenges society to change so that the disabled can see themselves as 'normal' and only impaired – not 'disabled' (Watson, 2002). The participants of this study also want change that would enable them not only to function independently but also to be portrayed as independent human beings. They opined that they have changed their life with the context and overcome many challenges and the remaining challenges can only be overcome with the changed lens of the society towards them. They also opined that it is neither their capacity nor their determination to prove their worth which keeps them restrained, but the lack of resources and services provisions. This aligns with the Social Model of disability as the model suggests disabled people are limited by their access to resources, not by their impairment (Hughes & Paterson, 1997).

This model views disability as a social construct – a shared understanding or a shared assumption about reality (Anastasiou & Kaufman, 2013; Oliver, 1996). From the perspective of this study's students with disabilities, particularly those with vision impairment but also those with other physical disabilities, they do feel ostracized and neglected, but do feel their needs are not being fully met. As the data clearly presented, the lack of functionality of the Braille printer, the slower and inadequate support from the Disability Offices and Resource Centres, the lack of necessary service points and unequal distribution of resources are the reason behind their falling behind, not their lack of any capability. As the analysis depicted, they see technology as a means for them to bypass and overcome their limitations, yet even after achieving success, people and peers sometimes treated them differently, which should be changed. It is self-evident, at least from the perspective of the participants of this study that, the societal constructs need reformation and so does the society.

The argument should focus on how a society perceives some limitations or conditions – for example, being ultra-poor, illiterate, single parents, LGBTI community – as 'permanent' characteristics of a marginalized group dictated by social stigma and narrow mindsets, and similarly focus on why disability would be viewed as permanent impairment. Like those other conditions, the disability is not a choice, and its consequences can be improved with proper means, as illustrated by the responses of the participants.

The Social Model of disability also explains why the disabled students of this research are troubled and seem to have no pathway that will give them the empowerment they are seeking. For they know they need assistance from others (individuals and organizations), but when they accept those supports, they become dependent, which works against a sense of empowerment and a sense of being 'normal'. The participants wanted this to be changed and

would like the institutions to have established provisions and systems so further independence could be fostered without the need for informal supports. The data also presented how sometimes the collective perceptions of the society that they needed some favour or additional support actually helped them to get through challenging situations and this research observed that conflict in logic. This is because, as the Social Model explains, we are still living in a society where the disabled are marginalized, socially oppressed and isolated, which not only the non-disabled but also the disabled acknowledge.

The Social Model has been influential in shaping public policy on disability matters and the education of students with disabilities in the United Kingdom, many countries in Europe, and on the wider international stage, including the United States, during the last two decades (Anastasiou & Keller, 2011; MacKay, 2002). The social model provides the basis for the development of approaches to support empowerment (Keyes et al., 2015), and "The 'Social Model' … has undoubtedly been the dominant paradigm in researching and understanding disability in recent years " (Dewsbury et al., 2004, p. 145). Many examples can be studied further and easily replicated in the context of Bangladesh to resolve the issues found in this research; however, the aspiration of the students towards 'being normal' and 'feeling empowered' should be an asset for that since it has been observed to have an important influence.

One of the changes should occur on the basis that the Social Model exists in opposition to the Medical Model, which sees disability as a personal problem (Shakespeare, 2006). Critics of the Medical Model see it as a model which denies the value of uniqueness and invalidates and ostracizes those who are disabled (Kattari et al., 2017). The Social Model of disability, on the other hand, describes disability as a by-product of social negligence. The Social Model also distinguishes between impairment and disability. It recognizes impairment as distinguished from disability (Kattari et al., 2017; Shakespeare, 2006). It defines impairment as individual and private ('someone who is blind', or who 'has limited mobility'), while defining disability as structural and public, as society's reaction to impairment, which then 'disables' individuals according to how their impairments operate within an 'ableist society' (Shakespeare, 2006) rather than seeing disability as an individual problem that needs to be 'fixed' (Shakespeare, 2006). The interviewed students also opined thus and argued that they are not empowered as the society, their peers and the academic settings perceive them as different. The Social Model recognises the disabling impact of labelling the 'disabled' as disabled and views 'disability' as a social and environmental issue (Fawcett, 2000). Also, very relevant to this

current research, the Social Model strives for empowerment. Keyes et al.'s (2015) model of empowerment through care draws on the Social Model for understanding empowerment. Supporting Shakespeare (2006), Keyes et al. (2015) argued that the beneficiaries of any services would be empowered if and when they have the control and choices to make to accommodate their needs. This also supports the findings, as the students repeatedly stressed the need to improve the service provisions, based also on students' own understanding and identification of their needs, and to develop a system so the external supports can reach them transparently and systematically, if there is a lack of institutional resources.

Dewsbury et al. (2004) state that the Social Model reframes 'disability' as the outcome of interactions. Oliver states that the Social Model of disability locates the problem of "disability squarely within society" (Terzi, 2004, p. 143), while Fawcett (2000) states that, "the social model of disability, sometimes called the social barriers model of disability … emphasises the segregationist, disablist (in that scientific objectivity is claimed which gives qualified professionals control over disabled people) and dependency creating implications of 'medical models' for disabled people" (Fawcett, 2000, p. 22). The words 'exclusion' and 'discrimination' were also used in Shakespeare (2006) to refer to the unfortunate satiations of disabled people and he repeatedly emphasizes to the need for social change as one significant aspect of the Social Model of disability (p. 199). For this he refers to the model as helping to improve self-esteem by building a positive sense of a collective identity. This scholarly narrative echoed the voices of the disabled students in the present study as they asked for not much additional services but a non-separatist structure and system that would allow them to be further self-dependent and to compete on a level playing field with others. Shakespeare also refers to 'disability' as a universal experience of humanity and thus hints further at the importance of the Social Model. The model argues that there is nothing wrong with disability, that it should be replaced with 'impairment' and that society should change so that the disabled are not ostracized, marginalized, nor made to try to fit into structures that are designed only for certain types of people. Such views were also observed in the findings of this study.

The data also presented the drive for normalizing the differences stressed as important by the interviewees, indicating the need for different systems and provisions which was also supported by Winance (2016). The Social Model, according to Winance (2016), questions the process of normalization – but not enough the "normative ideal" – of integrating the disabled into the society where they could also be empowered as everyone else. Her argument over the

Social Model's implication for changing the society to normalize the disabled people actually accommodate further towards adaptation over structured so that the disabled won't feel the need to fit. This also resonate with the concept of disabled-led empowerment presented by Keyes et al. (2015) among many others. The disabled led empowerment provisions prioritize the choices and decisions of the disabled themselves on the resource mobilization and aspects of care so that the empowerment remains authentic, and not imposed. According to Shakespeare and Watson, some scholars see the Social Model as a means of pushing forward constructs like discrimination and oppression as the primary causes of disability. Terzi (2004) criticises the Social Model for failing to acknowledge the practical impacts of impairment. In answer to this, the proponents of the Social Model stress that its emphasis is on biased policy construction and inequality (Reindal, 2009).

Shakespeare (2006) declares that UPIAS sees 'disabled' people as oppressed, and considers that non-disabled people and organizations cause or contribute to that oppression. It is not charity or pity that is required – they say – but civil rights, with the best insights coming from services and organizations run by disabled people (Shakespeare, 2006, p. 199). However, as mentioned before, Winance (2016) argued that the social model should expand further to ensure effective empowerment.

9.4 The drive to be empowered and 'normal'

Although the topic of this research is the technology experience of disabled students, it is clear that the disabled students from the University of Dhaka in Bangladesh are seeking more in both their student and personal lives. Whether this 'more' is labelled as resources, care, influence, or independence – it all points in the direction of being empowered and seen as 'normal'. As a whole, in relationship to their technology needs, although they are using technological devices and apps successfully, they are still struggling. They are getting many of their needs met, but it is not enough. This is because the empowerment and independence they receive from this are reduced by the feeling that it does not make them 'normal'.

The University of Dhaka students are successful, motivated students. They have been and still are, however, fighting 'for their rights'. Although they do not take for granted their positions at the university, they are not content – they need more change. The key word here is 'change', not 'changes'. Yes, they do need ongoing changes in all the areas mentioned in this thesis, but primarily they need one change – one big, overall change that will give them

empowerment and a sense of being 'normal'. The Social Model of disability pushes for this change.

The Social Model connects empowerment to social oppression, and sees the provision of services as breaking down barriers to inclusion (Barnes & Mercer, 2010, cited in Keyes et al., 2015), and therefore promoting independence (French & Swain, 2012, cited in Keyes et al., 2015).Researchers such as Morgan (2014) argue the same point in stating that the Social Model promotes service provision as the means to "self-determination, choice and control" (cited in Keyes et al., 2015, p. 238), with the users being influential in policy and the delivery of services, thus leading to empowerment (Morgan, 2014, cited in Keyes et al., 2015).

Keyes et al. (2015) see the Social Model as having two differing approaches regarding the pathway to empowerment. The first provides services "rooted in dependence and powerlessness" (Keyes et al., 2015, p. 239). The second – their recommended approach based on their perceptions of the Social Model – is to provide services in a fashion which promotes independence and autonomy. The student participants of this research – in this respect representative of disabled Bangladeshi HE students – are unfortunately living in a society where they are considered as 'not normal', and this will always work against their drive for empowerment and independency.

9.5 Recommendations and Limitations

9.5.1 Limitations of the research

The first limitation of this research is the smaller sample size, but that is justified given the methodology and overall nature of the study. It's important to consider that the aim of this research is to present snapshots of the scenario that are inter-related at depth, demystifying the factors involved and starting a discussion for future large-scale relevant research.

Secondly, because of that smaller sample size, this research's findings are not generalizable. As the cases came from a single institute, despite the validity achieved by applying the methodology protocols, contextually, it would be challenging to generalize the findings of this research.

Thirdly, the participants have not been observed in real-life over a long period. Since this research analysed the data collected by interview, despite multiple investigation to validate the data, there could be some inconsistencies. Since the participants may have responded

based on immediate perceptions in some cases, and the crude reality could be slightly different from the representation made in this research. Nevertheless, it is imperative to mention here that all data were collected and analysed following proper methodology protocols with objectivities and necessary verifications. Moreover, most participants concurred – individually – on many of their perceptions.

9.6.2 Recommendations for further research

The higher education environment in Bangladesh should develop further to accommodate the students with disability to accord them the fullest opportunities. The discussion has presented the challenge towards ensuring that an authentic, inclusive environment is provided and that this is multi-layered and complex. Based on the findings of the research and argument in the discussion, it is imperative to present a system transformation strategy.

Though Bybee's (1997) model for transforming science education was presented in terms of achieving scientific literacy, that framework can be adapted for achieving inclusive literacy. The model suggested bringing about changes in layers – Purpose, Policy, Program and Practice. However, as this research is a small-scale academic study with a smaller sample size, the recommendations made here are presented as suggestions for change and for attention at different layers and levels to foster the changes.

Purpose

Clarity

The lack of clarity of purpose in terms of integration and accommodating the students with disability in the higher education environment was astonishing. While the system's vision was targeting integration, its implementation was creating parallel arrangements. As the purpose leads to policy development and its implementation, therefore, as a priority, the institutes should define the purpose clearly through participation and discussion. Following that lead, this research recommends defining the purpose of technology access and utilization so that both the providers (the institutes) and the clients (the students with disability) have a voice and are on the same page.

Adaptability

The research also recommends an adaptive purpose which can bring in newer technologies and can address newer sets of challenges. The traditional 'inclusion' often points to

infrastructural development, which in this case can unburden the institutes with making the hardware available. However, as this study found and made arguments regarding access to up-to-date software resources (licences, compatibility, currency etc.), this study suggests the need to make provisions for adaptability embedded into purpose so that the students with disability who face challenges with change, can be better prepared and adapt with ease.

Policy

Policy for Integration

The lack of proper policy and strategies on how to integrate support into the systems in all aspects of the academic environment produce a 'no-guidance' scenario where the changes made are not, sometimes, compatible with each other. This also puts the already achieved progress in jeopardy and leads to challenges ahead.

Therefore, this research recommends a comprehensive and unambiguous policy framework on integrating students with disability into the system. This policy also needs to be well communicated across the academic and administrative staff as well as to all of the students.

Policy borrowing can be considered and it would be a recommendation of this study to analyze the best practices from other developed countries and high-ranked institutes and then go for necessary localization.

Policy for Collaboration

A policy for collaboration is one of the most needed policy structures in the context of this research. Since many Civil Society Organizations and NGOs are interested in providing support, the lack of policy framework is the main challenge in ensuring equal opportunity among the students with disability in accessing these services. The lack of this policy also makes the donation-giving and support-providing mechanism difficult and full of unnecessary hassles. Therefore, this study is recommending that universities develop a collaboration policy (also including external organizations) which would not only ensure obtaining resources but would also maintain a continuous flow of necessary resources and supports.

Policy for Accountability

The provisions for accountability should be endorsed and enforced by the university administration, so the already available resources can be utilized to the fullest extent. The accountability policy will create the provisions for action by relevant entities and personnel in real-time. This also creates the provisions for making the support services available in the classes, libraries, residence halls and in other informal academic/social environments. In addition, this study also recommends employing and therefore utilizing the social resources already functioning, but with systematic approaches.

Programs

Infrastructure Development Programs

In order to work toward ensuring technology access and creating the necessary enabling environment, this research recommends designing an infrastructure development program aligning with the well-defined purpose and firmly formed policies. The aim of this program would be to build an enabling environment with all necessary technology and human resources within a framework and to ensure its access to all students in need. For example, it could be a one-stop support service centre for the students with disability, technology orientation, resource allocations protocols, read-out-loud campus maps etc. Also, it could include the Braille printing facilities, a 24/7 call centre for the students with disability, accessible toilets and dining and so on.

Sensitization Programs

As this research found, the stigma among the overall students in addressing difference is an issue for the self-respect of the students with disabilities. This study also found that, in many cases the other students did not know how to help the students with disability even if they wanted.

Therefore, this research recommends developing a comprehensive program for sensitizing all the existing and newcomer students, orienting them about all these issues. The involvement of students with disabilities in such programs is recommended.

Connecting Resources Program

This research found the existence of many available formal and informal resources and if these resources were connected and developed further, the students with disability could benefit considerably. For example, one Braille printer was donated to the university and because of the lack of proper training for printing and lack of protocols for using it, the students cannot benefit from it. As observed, there are organizations that are intended to support in this regard too. So, this study recommends conducting a comprehensive landscape analysis study to locate the resources and therefore work on connecting them.

 Practice

This study observed, as mentioned before, the presence of an informal support mechanism among the students with disabilities and other peers. With the clearer purpose and suggested policy and programs mentioned above, the practice will be changing further and will be friendlier to the students with disability. However, some on-campus campaigns can be developed to boost the desired changes.

9.5 Conclusion

The research questions of this research have been addressed. This thesis has revealed how and why students with disabilities engage with digital technologies at university. It has revealed and discussed the barriers these students face, as well as insights into the provision of technology resourcing and the students' perceptions of the value of their use of digital technologies. Each of these questions has been addressed and answered throughout the findings chapters and in this chapter. The conclusions to this research – as stated throughout this chapter – go beyond the findings to paint a picture of the students' overall technology needs, and to specify both why they are not being satisfied and how they can be.

In summary, the students have been making very good use of technology and this technology has been an immense benefit for them in their studies. It has not solved all their problems, but it has helped to set them on a pathway to empowerment. It is not just their use of technology, however, which set them on this pathway, it is also the factors at play in the provision of this use – factors such as their social capital. Students with greater social capital are more likely to be successful in their use of technology, and thus more likely to feel empowered. As such, students with greater access to resources are more likely to feel empowered.

This research also uncovered the fact that in many ways it was not enough for these students to have the resources and the social capital that empower them – they still had the drive to feel 'normal'. Thus, as the Social Theory of disability explains, for further value from the use of technology resources, and therefore empowerment – these students with disabilities need change in the way society views disability. This requires that disability should not be seen as a problem of the student, but as an issue created by society and thus an issue which society needs to address. Under these circumstances, the use of technology by disabled students at The University of Dhaka will be both easier to obtain and more beneficial.

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Appendices

Appendix I: Researcher's personal context

Born in Bangladesh, I spent my first 30 years as part of a middle-class family comprising myself, my mother and my sister in Dhaka, the capital. My secondary education was in a government school through to class 10, and then in a government college for classes 11 and 12. This was a free education, and my mother could not afford anything else. After my secondary schooling I went to a public university – the University of Dhaka.

Throughout all my education I stayed with my family in a small rented house in a busy part of central Dhaka. We had no guardian – no father or older brother. My mother struggled a lot. We had financial issues with no one earning, and all I could do as a full-time student was study, from morning to late evening, with very small funds raised from some private tuition that I provided. In Bangladesh it is not good for someone from a middle-class family to work in a 'less-dignified' job. Tuition was the only respectable job for someone in my position. We also had security issues.

A brief history of Bangladesh

The country of Bangladesh has a mixed history- it was once part of Pakistan. But then in 1947, after a long revolution, the British left the Indian Sub-Continent – comprising present day India, Pakistan and Bangladesh – after ruling it since they had invaded it in 1757. Before leaving, however, the British divided these lands into two parts. What is now called Bangladesh was then a part of one of these two parts – Pakistan – while the other part was called India.

At the time the major political parties were happy. Pakistan was ruled by the Muslim League. India was ruled by the mainly Hindu Indian Congress. It was the Muslim League who initially suggested to the British that they divide their 'Indian Sub-Continent' in this way. Yet years later in 1971, at the culmination of a nine-month bloody war, what was then known as East Pakistan liberated itself from Pakistan to become Bangladesh.

From 1971 Bangladesh has been independent, with Dhaka as its capital. It is surrounded by India, Bhutan and Myanmar (Burma) and has a dense population of about 163 million. The majority of these are Muslim, and the main economies are the production of rice and other crops, and ready-made garments. There is much poverty and illiteracy, but after decades of

impoverishment the country is now growing, although still on the International Least Developed Countries list (the LDC list).

Primary education is free in this country. The governing party changes at the National Elections every five years, and Bangladesh now knows political stability.

Dhaka, the city where I lived, is a very densely populated capital of 20 million – the approximate population of all of Australia. Everyone wants to come to the capital and more are flocking there all the time. All opportunity lies there, everything is much easier there for billionaires, rich people, those who sleep on the street, and the middle-class. There is poverty, but people are not dying of starvation. It is still not a clean city with much garbage on the streets. However, as well as being a city where people live and flock to, Dhaka is a city of both industry and commerce, and now education also.

My education

At University of Dhaka I completed both a Bachelor and Master of Education. My speciality was teaching visually impaired students. As part of this, from my first year of university I worked with visually impaired students. I did very well in my studies.

Near the end of my Bachelor's degree course, I was posted to a visually impaired girls' school for my practice teaching. I trained here for six months and throughout this period I saw how these girls learned. They learned everything through touch. It was here that I learned Braille and mathematical skills for the visually impaired, which beforehand I hadn't even known existed – these girls learned the abacus as well as using other devices to do mathematics. As a new learner I even learned from senior students who knew better than me.

This is where I first developed an interest in students with disabilities, but at this stage my interest and expertise was only with those with visual impairments. Doing my Masters from the same institute I did my thesis on visually impaired students. While doing this thesis, through my studies of literature on an international level, I saw what was happening in other countries. I came to understand that technology could very much assist visually impaired students and even virtually replace their sight to some extent. At this time, however, technology was not very available for visually impaired students. This was in 2005 and I could not find any people around me who were receiving the assistance of technology.

After my Masters I got a teaching job at University of Dhaka and saw students with many different types of disability – mainly hearing and physical disabilities. Then I started learning about these other disabilities also and how technology could be used to assist students with

these disabilities. It was then 2008 and people were beginning to use technology in Bangladesh – particularly smart phones with talking software, and talking clocks. But it was still only very few who had access to technologies such as these.

I had studied technology in my Masters and seen what was available for those with visual impairments. Now I was seeing students with other types of disabilities, and felt that I needed to extend my interests. So, after I started teaching at University of Dhaka my area of interest quickly extended to all types of disabilities.

For myself there was one question I had to face. Students with disabilities not only needed access to all types of technologies that might be beneficial to them, but they also needed assistance in other areas of their student life such as empowerment, employment, and dealing with social issues. My decision was not difficult. Firstly, I already had the background and expertise in technology for students with disabilities. Secondly, in 2009 the government of Bangladesh adopted a national program called 'Digital Bangladesh' – the government had started to digitalise everything.

Until 2009 we hadn't had websites for government departments, or data bases for schools and public employees. Everything was only in hard copy, so the government Digital Bangladesh program impacted every sector – including classrooms and learning systems. What can I do, I thought – something in the area of both technology and students with disabilities?

At this stage there were very few supports or programs for students – or any people – with disabilities. It seemed to me that somehow these people were neglected. In addition, I knew these people. There are so many people in Bangladesh with disabilities and this included people around me in my daily life. I thought about them often and wondered – should these people be 'handicapped' because they did not have the physical abilities – the 'normal' physical abilities – which others had?

I decided I wanted to do more, to learn more, on this unexplored, neglected topic – but due to my teaching responsibilities I could not undertake further research in a PhD at this time, although I felt sure I would do so later.

I waited – teaching at Dhaka until 2014. Throughout this time, I began to notice a worldwide trend, that the use of technology was changing dramatically, including, on a smaller scale, for students with disability. They were now using laptops and various applications and I would ask them about these things.

I applied for scholarships in Japan (a country strong in technology) and in Australia. I was accepted in both countries. I had colleagues with study leave doing PhDs in Australia. I had visited Japan in 2010 for a training program and loved the country immensely. As a result of my applications I received an offer for a scholarship at Hiroshima University, and an offer from Australia. I accepted the Australian offer as I wanted to study in an English-speaking country. I did not feel I could find the time to learn Japanese and I realized I would have to if I studied in Hiroshima as it is a city a long way from the parts of Japan where English is more common. Besides, Monash University is an exciting institute to study as many of my fellow scholars in Bangladesh have studied there and spoke highly about the amazing learning environment with greater academic support and resources. So, there I was, in Australia researching on a topic which is very important to me, and with that ambition of making a difference in the lives of future students with disabilities.

The Journey

Once I read from Robert J. Hastings "Sooner or later we must realize there is no station, no one place to arrive at once and for all".[4] And that's the truth for every researcher, every academic, as I feel that interesting things always keep happening around me and the researcher's interest is drawn to those to explore further.

However, for this PhD research, I set a tangible goal based on my research interest and area where I could see chances for making greater impact. However, like all journeys, it was challenging, and I needed to stay patient following the steps and road ahead. While studying in Australia, my physical condition deteriorated and I had to go through five (5) surgeries that costed a great deal not only financially and physically, but also most importantly, in time. I had to take leave from my studies while going through those procedures and that slowed me down towards completing the research work. Meanwhile, I also had to deal with the rules and regulations of the scholarship as the amount of leave I needed was not allowed. I had to meet challenges at those heady times, working while still recovering from those procedures. But, at the end, my scholarship ended before the end of my academic period. That put me in a difficult position as it wouldn't be possible for me to stay and continue my study without the scholarship's financial support. As my visa has also expired, and I had to come back to my

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[4] American Author; this quote was taken from his famous book 'The Station'

country. I would like to express my earnest gratitude to my professor who supported and counselled me throughout those days and helped me make those big decisions.

The relocation and resettlement took a large amount of time as I had been gone for a long time. In addition, as a faculty member of University of Dhaka, I had been away from responsibility for long and needed to catch up with my duties. Also, I had to take some additional surgeries and medical procedures. All these caused a major setback to pick up the unfinished work on my thesis. After over a year, while I picked up, I had to go through the data sets, the literature and the draft report again but this helped me to gain a fresh perspective. During the past year, with that fresh perspective and final reworking, I have produced the thesis and seeing the report finalized brought me enormous happiness just as the view of the destination, when it appears, bring joys to the mind of an explorer.

Appendix II: Ethics approval certificate

MONASH University
Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

This is to certify that the project below was considered by the Monash University Human Research Ethics Committee. The Committee was satisfied that the proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research* and has granted approval.

Project Number:	CF15/4294 - 2015001840	
Project Title:	Digital technology and the disabled students' experience of higher education	
Chief Investigator:	Prof Neil Selwyn	
Approved:	**From:** 16 November 2015	**To:** 16 November 2020

Terms of approval - *Failure to comply with the terms below is in breach of your approval and the Australian Code for the Responsible Conduct of Research.*

1. The Chief investigator is responsible for ensuring that permission letters are obtained, <u>if relevant</u>, before any data collection can occur at the specified organisation.
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
4. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must include your project number.
6. **Amendments to the approved project (including changes in personnel):** Require the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
7. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
8. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
10. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
11. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

Professor Nip Thomson
Chair, MUHREC

cc: Assoc Prof Umesh Sharma, Mr Md Shahrier Haider

Monash University, Room 111, Chancellery Building E
24 Sports Walk, Clayton Campus, Wellington Rd
Clayton VIC 3800, Australia
Telephone: +61 3 9905 5490 Facsimile: +61 3 9905 3831
Email: muhrec@monash.edu http://intranet.monash.edu.au/researchadmin/human/index.php
ABN 12 377 614 012 CRICOS Provider #00008C

Appendix IIIA: Sample explanatory statement for student participants

MONASH University

EXPLANATORY STATEMENT for student group

NOTE: This information sheet is for you to keep

Project: Digital technology and disabled students' experience of higher education

Chief Investigator's name	**Student's name**
Professor Neil Selwyn	Md Shahrier Haider
Faculty of Education	Phone :+8801716528182
Phone: 99029076	+61452348182 (Australia)
email: neil.selwyn@monash.edu	email: md.s.haider@monash.edu

You are invited to take part in this study. Please read this Explanatory Statement in full before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to contact the researchers via the phone numbers or email address listed above.

What does the research involve?

This research will examine the roles that digital technologies are now playing in experiences of students with disability of contemporary massified higher education. The research will particularly investigate the experiences of students with disability when encountering and using digital technology in University of Dhaka.

The study involves you participating in three interviews, each of them will require approximately 60 minutes. You will be asked questions regarding you digital technology experiences in the university. The three interviews will be conducted with intervals in days. The interview time and venue will be decided according to your preference.

In addition the study involves you participating in a focus group discussion with other nine students with disability of this university who are also participating in this study. This focus group will last for approximately 90-120 minutes. Please note that, all these sessions will be audio recorded and once all the interviews and focus group discussion are completed you will be provided with a copy of what

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you said (transcript) for your approval after the information has been collected, and you can make suggestions for changes if you do not agree that it is accurate.

Along with these interviews and group discussion you are required to maintain a 'technology activity log' to detail your digital practices over the course of three typical days. In the diaries you will be required to keep a register of the patterns, frequency, duration and purpose of uses of digital technology. You may also keep an account of any barriers and/or inhibitors experienced with course of technology use. After completing the diary exercise the researcher will collect it for his analysis. A sample format of the diary will be delivered to you, however you can use your own format indicating the similar prompts mentioned in this tabular format.

You are allowed to bring a friend, peer or a family member with you during the time of the interviews to assist you in participating or if you think their presence will help you to feel comfortable.

Why were you chosen for this research?

Since University of Dhaka is the counting largest HEIs in Bangladesh in terms of number of students with disability and has a full-time 'disability officer' who is responsible for managing issues related with disabled students in the university, it seems this university could provide representative number of participants. This research needed students with disability who are studying in this university and use technology for their learning. Since you have fulfilled both the criteria of participation and you expressed interest to participate, you have been chosen as a participant for the study.

Consenting to participate in the project and withdrawing from the research

The interviews, focus groups and diary practice do not contain any sensitive or personal questions or activities. The purpose is draw out your experience about digital technology in the university. And also to know what the impact it has on your learning and living in the university. There are no right or wrong answers. Be reassured that we are not evaluating your understanding of the content, nor judging your knowledge or skills as a digital technology user. The questions that I will be asking you are not likely to cause distress, nor minor or major inconvenience during the time that are involved in the research project. However, should you feel a need to stop participating in any of the data collection methods, you can do so at any time without the need to explain further your decision.

Consent form to participate in this study is attached with this explanatory statement. After filling out the consent form you may return it through email of the researcher or handed over to him in person. Being in this study is voluntary and you are under no obligation to consent to participate; therefore, you can withdraw from the study at any time and this will in no way be related to any academic issue.

Possible benefits and risks to participants

This study will examine the digital technology experiences of students with disability in the context of University of Dhaka, Bangladesh i.e. what technology they are using and how do they find the impact of those technology on their learning as well as living in the university. Outcomes from this study will be useful in a number of ways; mainly for you by giving a voice to talk about what you have experienced in the university. Furthermore, the study may also potentially help relevant authorities of the university to plan actions for promoting useful digital facilities/opportunities by first understanding the reality about technology experiences of students with disability. The findings are likely to be relevant for the faculty members as well as peers to develop new insights about how they should support students with disability to becoming an effective member of the 'digital Bangladesh' programme initiated by the MoE and the Ministry of primary and mass education (MoPME) by introducing computer aided learning, technology enhanced teaching learning process, teacher development programs and skills improvization in all level of education.

It is not foreseen that the subject of the research will cause you any psychological distress. If however you do experience any discomfort or stress during the course of the research, you can abort your participation and if required consult the University Student counselling service and/or support staff located at the Teacher-Student Center (TSC).

Confidentiality

The information collected in the interviews, focus group and diary will be treated as strictly confidential and used only for the research purposes. Data will be reported in such a way to reflect the anonymity of the participants. In addition, pseudonyms will be used in the reporting of research results in any publication. The identity of the participants will be protected and access to the information will be restricted to the researchers only. Therefore, personal and identifying information that you provide in the study will remain confidential. No personal information will be revealed in any reports or publications using the research.

In order that others can learn about the outcomes of this research, we will be presenting findings in a range of occasions – at conferences, in on-line journal and print based journals, books and other activities associated with education.

We can also use the data for more other purposes additional to the purposes listed above. However, due to the nature and timing of a PhD case study, we cannot withdraw data retrospectively after 12 months from the commencement of the research**.**

Storage of data

Storage of the data collected will adhere to the Monash University regulations and kept on University premises in a locked cupboard/filing cabinet for 05 years.

Results

The research will be published in the form of a doctoral thesis. If you would like to be informed of the aggregate research results or would like to provide feedback on the research results then you are most welcome to contact the researcher on md.s.haider@monash.edu

Complaints

Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the following person:
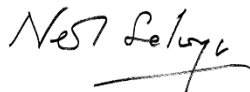

Professor Dr Diba Hossain
Department of Special Education
Institute of Education and Research (IER), University of Dhaka,
Bangladesh
Ph.: +88 02 9873025, Cell: +8801726111403
Email: diba_h@yahoo.com

Thank you for your time.

Neil Selwyn

(Chief Investigator's signature)

Chief Investigator's name: Professor Neil Selwyn

Appendix IIIB: Sample explanatory statement for faculty and staff

MONASH University

EXPLANATORY STATEMENT for faculty and staff group

NOTE: This information sheet is for you to keep

Project: Digital technology and disabled students' experience of higher education

Chief Investigator's name	**Student's name**

Professor Neil Selwyn   Md Shahrier Haider

Faculty of Education   Phone :+8801716528182

Phone: 99029076   +61452348182 (Australia)

email: neil.selwyn@monash.edu   email: md.s.haider@monash.edu

You are invited to take part in this study. Please read this Explanatory Statement in full before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to contact the researchers via the phone numbers or email addresses listed above.

What does the research involve?

This research will examine the roles that digital technologies are now playing in experiences of students with disability of contemporary massified higher education. The research will particularly investigate the experiences of students with disability when encountering and using digital technology in University of Dhaka.

The study involves you participating in an interview that will require approximately 60-90 minutes. You will be asked questions regarding your perception and engagement with digital technology experiences of students with disabilities. The interview time and venue will be decided according to your preference.

Please note that, all the session will be audio recorded and once the interviews is completed you will be provided with a copy of what you said (transcript) for your approval after the information has been collected. You can make suggestions for changes if you do not agree that it is accurate.

You are allowed to bring a friend, peer or a family member with you during the time of the interview to assist you in participating or if you think their presence will help you to feel comfortable.

Why were you chosen for this research?

Since University of Dhaka is the counting largest HEIs in Bangladesh in terms of number of students with disability and has a full-time 'disability officer' who is responsible for managing issues related with disabled students in the university, it seems this university could provide representative number of participants. Apart from students with disabilities this research needed people who are engaged with the students and can provide important information regarding various issues of technology experiences of students with disabilities. Since you have fulfilled both the criteria of participation and you expressed interest to participate, you have been chosen as a participant for the study.

Consenting to participate in the project and withdrawing from the research

The interview does not contain any sensitive or personal questions or activities. The purpose is draw out your perception, support, and feedback regarding experience of students with disabilities about digital technology in the university. There are no right or wrong answers. Be reassured that we are not evaluating your understanding of the content, nor judging your knowledge or skills as a digital technology user. The questions that I will be asking you are not likely to cause distress, nor minor or major inconvenience during the time that are involved in the research project. However, should you feel a need to stop participating in any of the data collection methods, you can do so at any time without the need to explain further your decision.

Consent form to participate in this study is attached with this explanatory statement. After filling out the consent form you may return it through email of the researcher or handed over to him in person. Being in this study is voluntary and you are under no obligation to consent to participate; therefore, you can withdraw from the study at any time and this will in no way be related to any academic issue.

Possible benefits and risks to participants

This study will examine the digital technology experiences of students with disability in the context of University of Dhaka, Bangladesh i.e. what technology they are using and how do they find the impact of those technology on their learning as well as living in the university. Outcomes from this study will be useful in a number of ways; mainly by giving a voice to talk about what the students have experienced in the university. Furthermore, the study may also potentially help relevant authorities of the university to plan actions for promoting useful digital facilities/opportunities by first understanding the reality about technology experiences of students with disability. The findings are likely to be relevant for the faculty members as well as peers to develop new insights about how they should support students with disability to becoming an effective member of the 'digital Bangladesh' programme initiated by the MoE and the Ministry of primary and mass education

(MoPME) by introducing computer aided learning, technology enhanced teaching learning process, teacher development programs and skills improvisation in all level of education.

It is not foreseen that the subject of the research will cause you any psychological distress. If however you do experience any discomfort or stress during the course of the research, you can abort your participation and if required consult the University Student counselling service and/or support staff located at the Teacher-Student Center (TSC).

Confidentiality

The information collected in the interviews will be treated as strictly confidential and used only for the research purposes. Data will be reported in such a way to reflect the anonymity of the participants. In addition, pseudonyms will be used in the reporting of research results in any publication. The identity of the participants will be protected and access to the information will be restricted to the researchers only. Therefore, personal and identifying information that you provide in the study will remain confidential. No personal information will be revealed in any reports or publications using the research.

In order that others can learn about the outcomes of this research, we will be presenting findings in a range of occasions – at conferences, in on-line journal and print based journals, books and other activities associated with education.

We can also use the data for more other purposes additional to the purposes listed above. However, due to the nature and timing of a PhD case study, we cannot withdraw data retrospectively after 12 months from the commencement of the research**.**

Storage of data

Storage of the data collected will adhere to the Monash University regulations and kept on University premises in a locked cupboard/filing cabinet for 05 years.

Results

The research will be published in the form of a doctoral thesis. If you would like to be informed of the aggregate research results or would like to provide feedback on the research results then you are most welcome to contact the researcher on md.s.haider@monash.edu

Complaints

Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the following person:
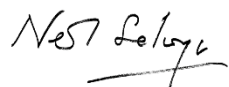
Professor Dr Diba Hossain
Department of Special Education
Institute of Education and Research (IER), University of Dhaka,

Bangladesh

Ph.: +88 02 9873025, Cell: +8801726111403

Email: diba_h@yahoo.com

Thank you for your time.

(Chief Investigator's signature)

Chief Investigator's name: Professor Neil Selwyn

Appendix IIIC: Sample explanatory statement for staff from philanthropic organization

MONASH University

EXPLANATORY STATEMENT for staff from Philanthropic organization

NOTE: This information sheet is for you to keep

Project: Digital technology and disabled students' experience of higher education

Chief Investigator's name	**Student's name**
Professor Neil Selwyn	Md Shahrier Haider
Faculty of Education	Phone :+8801716528182
Phone: 99029076	+61452348182 (Australia)
email: neil.selwyn@monash.edu	email: md.s.haider@monash.edu

You are invited to take part in this study. Please read this Explanatory Statement in full before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to contact the researchers via the phone numbers or email addresses listed above.

What does the research involve?

This research will examine the roles that digital technologies are now playing in experiences of students with disability of contemporary massified higher education. The research will particularly investigate the experiences of students with disability when encountering and using digital technology in University of Dhaka.

The study involves you participating in an interview that will require approximately 60-90 minutes. You will be asked questions regarding your perception and engagement with digital technology experiences of students with disabilities. The interview time and venue will be decided according to your preference.

Please note that, all the session will be audio recorded and once the interviews is completed you will be provided with a copy of what you said (transcript) for your approval after the

information has been collected. You can make suggestions for changes if you do not agree that it is accurate.

You are allowed to bring a friend, peer or a family member with you during the time of the interview to assist you in participating or if you think their presence will help you to feel comfortable.

Why were you chosen for this research?

You have been chosen for this study because your organization is nominated by the participants with disabilities in this research. We have been informed that, your organization has been supporting students with disabilities for their living and learning. Along with students with disabilities, this research also needs participants like you who are engaged with students with disabilities and can provide information regarding various issues of digital technology experience of students with disabilities.

Consenting to participate in the project and withdrawing from the research

The interview does not contain any sensitive or personal questions or activities. The purpose is draw out your perception, support, and feedback regarding experience of students with disabilities about digital technology in the university. There are no right or wrong answers. Be reassured that we are not evaluating your understanding of the content, nor judging your knowledge or skills as a digital technology user. The questions that I will be asking you are not likely to cause distress, nor minor or major inconvenience during the time that are involved in the research project. However, should you feel a need to stop participating in any of the data collection methods, you can do so at any time without the need to explain further your decision.

Consent form to participate in this study is attached with this explanatory statement. After filling out the consent form you may return it through email of the researcher or handed over to him in person. Being in this study is voluntary and you are under no obligation to consent to participate; therefore, you can withdraw from the study at any time and this will in no way be related to any academic issue.

Possible benefits and risks to participants

This study will examine the digital technology experiences of students with disability in the context of University of Dhaka, Bangladesh i.e. what technology they are using and how do they find the impact of those technology on their learning as well as living in the university. Outcomes from this study will

be useful in a number of ways; mainly by giving a voice to talk about what the students have experienced in the university. Furthermore, the study may also potentially help relevant authorities of the university to plan actions for promoting useful digital facilities/opportunities by first understanding the reality about technology experiences of students with disability. The findings are likely to be relevant for the faculty members as well as peers to develop new insights about how they should support students with disability to becoming an effective member of the 'digital Bangladesh' programme initiated by the MoE and the Ministry of primary and mass education (MoPME) by introducing computer aided learning, technology enhanced teaching learning process, teacher development programs and skills improvisation in all level of education.

It is not foreseen that the subject of the research will cause you any psychological distress. If however you do experience any discomfort or stress during the course of the research, you can abort your participation and if required consult the University Student counselling service and/or support staff located at the Teacher-Student Center (TSC).

Confidentiality

The information collected in the interviews will be treated as strictly confidential and used only for the research purposes. Data will be reported in such a way to reflect the anonymity of the participants. In addition, pseudonyms will be used in the reporting of research results in any publication. The identity of the participants will be protected and access to the information will be restricted to the researchers only. Therefore, personal and identifying information that you provide in the study will remain confidential. No personal information will be revealed in any reports or publications using the research.

In order that others can learn about the outcomes of this research, we will be presenting findings in a range of occasions – at conferences, in on-line journal and print based journals, books and other activities associated with education.

We can also use the data for more other purposes additional to the purposes listed above. However, due to the nature and timing of a PhD case study, we cannot withdraw data retrospectively after 12 months from the commencement of the research**.**

Storage of data

Storage of the data collected will adhere to the Monash University regulations and kept on University premises in a locked cupboard/filing cabinet for 05 years.

Results

The research will be published in the form of a doctoral thesis. If you would like to be informed of the aggregate research results or would like to provide feedback on the research results then you are most welcome to contact the researcher on md.s.haider@monash.edu

Complaints

Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the following person:

Professor Dr Diba Hossain
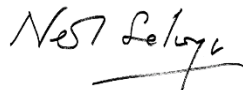Department of Special Education
Institute of Education and Research (IER), University of Dhaka,
Bangladesh
Ph.: +88 02 9873025, Cell: +8801726111403
Email: diba_h@yahoo.com

Thank you for your time.

(Chief Investigator's signature)

Chief Investigator's name: Professor Neil Selwyn

Appendix IIID: Sample explanatory statement for senior student

MONASH University

EXPLANATORY STATEMENT for senior student group

NOTE: *This information sheet is for you to keep*

Project: Digital technology and disabled students' experience of higher education

Chief Investigator's name	**Student's name**
Professor Neil Selwyn	Md Shahrier Haider
Faculty of Education	Phone :+8801716528182
Phone: 99029076	+61452348182 (Australia)
email: neil.selwyn@monash.edu	email: md.s.haider@monash.edu

You are invited to take part in this study. Please read this Explanatory Statement in full before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to contact the researchers via the phone numbers or email   addresses   listed   above.

What does the research involve?

This research will examine the roles that digital technologies are now playing in experiences of students with disability of contemporary massified higher education. The research will particularly investigate the experiences of students with disability when encountering and using digital technology in University of Dhaka.

The study involves you participating in an interview that will require approximately 60-90 minutes. You will be asked questions regarding your perception and engagement with digital technology experiences of students with disabilities. The interview time and venue will be decided according to your preference.

Please note that, all the session will be audio recorded and once the interviews is completed you will be provided with a copy of what you said (transcript) for your approval after the information has been collected. You can make suggestions for changes if you do not agree that it is accurate.

You are allowed to bring a friend, peer or a family member with you during the time of the interview to assist you in participating or if you think their presence will help you to feel comfortable.

Why were you chosen for this research?

You have been selected to participate in this research as you are identified as a 'mentor' students (i.e. older students who are in a mentoring role in terms of introducing new students to the university).

Consenting to participate in the project and withdrawing from the research

The interview does not contain any sensitive or personal questions or activities. The purpose is draw out your perception, support, and feedback regarding experience of students with disabilities about digital technology in the university. There are no right or wrong answers. Be reassured that we are not evaluating your understanding of the content, nor judging your knowledge or skills as a digital technology user. The questions that I will be asking you are not likely to cause distress, nor minor or major inconvenience during the time that are involved in the research project. However, should you feel a need to stop participating in any of the data collection methods, you can do so at any time without the need to explain further your decision.

Consent form to participate in this study is attached with this explanatory statement. After filling out the consent form you may return it through email of the researcher or handed over to him in person. Being in this study is voluntary and you are under no obligation to consent to participate; therefore, you can withdraw from the study at any time and this will in no way be related to any academic issue.

Possible benefits and risks to participants

This study will examine the digital technology experiences of students with disability in the context of University of Dhaka, Bangladesh i.e. what technology they are using and how do they find the impact of those technology on their learning as well as living in the university. Outcomes from this study will be useful in a number of ways; mainly by giving a voice to talk about what the students have experienced in the university. Furthermore, the study may also potentially help relevant authorities of the university to plan actions for promoting useful digital facilities/opportunities by first understanding the reality about technology experiences of students with disability. The findings are likely to be relevant for the faculty members as well as peers to develop new insights about how they should support students with disability to becoming an effective member of the 'digital Bangladesh' programme initiated by the MoE and the Ministry of primary and mass education (MoPME) by introducing computer aided learning, technology enhanced teaching learning process, teacher development programs and skills improvisation in all level of education.

It is not foreseen that the subject of the research will cause you any psychological distress. If however you do experience any discomfort or stress during the course of the research, you can abort your participation and if required consult the University Student counselling service and/or support staff located at the Teacher-Student Center (TSC).

Confidentiality

The information collected in the interviews will be treated as strictly confidential and used only for the research purposes. Data will be reported in such a way to reflect the anonymity of the participants. In addition, pseudonyms will be used in the reporting of research results in any publication. The identity of the participants will be protected and access to the information will be restricted to the researchers only. Therefore, personal and identifying information that you provide in the study will remain confidential. No personal information will be revealed in any reports or publications using the research.

In order that others can learn about the outcomes of this research, we will be presenting findings in a range of occasions – at conferences, in on-line journal and print based journals, books and other activities associated with education.

We can also use the data for more other purposes additional to the purposes listed above. However, due to the nature and timing of a PhD case study, we cannot withdraw data retrospectively after 12 months from the commencement of the research**.**

Storage of data

Storage of the data collected will adhere to the Monash University regulations and kept on University premises in a locked cupboard/filing cabinet for 05 years.

Results

The research will be published in the form of a doctoral thesis. If you would like to be informed of the aggregate research results or would like to provide feedback on the research results then you are most welcome to contact the researcher on md.s.haider@monash.edu

Complaints

Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the following person:

Dr Diba Hossain

Professor

Department of Special Education
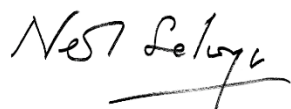
Institute of Education and Research (IER)

University of Dhaka, Bangladesh

Ph.: +88 02 9873025

Cell: +8801726111403

Email: diba_h@yahoo.com

Thank you for your time.

(Chief Investigator's signature)

Chief Investigator's name: Professor Neil Selwyn

Appendix IV: Sample consent form for participants

MONASH University

Monash University Human Research Ethics Committee (MUHREC)

CONSENT FORM

Project: **Digital technology and disabled students' experience of higher education**

Chief Investigator: **Professor Neil Selwyn**

NOTE: This consent form will remain with the Monash University researchers for their records

I have been asked to take part in the Monash University research project specified above. I have read and understood the Explanatory Statement which I kept for my records and I hereby consent to participate in this project.

I consent to the following:	Yes	No
To be interviewed three times by the researcher for 60 minutes at time and place of my convenience	☐	☐
To participate in a focus group of 10 people including me	☐	☐
To allow the interviews and focus group discussion to be audio-taped	☐	☐
To make myself available for a further interview if required.	☐	☐

I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way.

I understand that any data that the researcher extracts from the interview can be used in reports, conferences, and publications and for other educational purposes. However, publications will not, under any

circumstances, contain names or identifying characteristics, but some images may appear in presentations at conferences and other activities for the purposes of supporting education in this important area. I will have the opportunity to view source material that may be used in the future for these educational activities.

I understand that I will be given a transcript of data concerning me for my approval before it is included in the write up of the research.

I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party.

I understand that data from the interview, including the audio-tape and transcript will be kept in secure storage and accessible to the research team. I also understand that the data will be destroyed after a ten-year period from the conclusion to the research.

Name of Participant _____

Participant Signature _____ **Date** _____

Appendix V: Consent for receiving complaints

<u>Consent to Receive the Participant's Complaints</u>

Research Title: **Digital technology & the disabled students' experience of higher education**

Researcher: MdShahrierHaider. Student ID# 24926345, PhD student, Monash University

I agree to receive the participant's complaints concerning the manner in which the above-mentioned research conducted. I will report such complaints (if there is any) to Monash University Human Research Ethics Committee (MUHREC) to the following address:

Executive Officer
Monash University Human Research Ethics Committee (MUHREC)
Room 111, Building 3e
Research Office
Monash University VIC 3800
Tel: +61 3 9905 2052
Email: muhrec@monash.edu
Fax: +61 3 9905 3831

Dr Diba Hossain
Professor
Department of Special Education
Institute of Education and Research (IER)
University of Dhaka, Bangladesh
Ph.: 88-02-9873025
Cell: 01726111403
Email: diba_h@yahoo.com

Appendix VI: Participant profiles

Case 1

Ahmed is a 21-year-old male student studying for a Bachelor of Education (Honours) degree. He is a first-year student at the Department of Special Education, the Institute of Education and Research, at the University of Dhaka. Ahmed is classified by the university as a student with visual impairment, having partial vision from birth and total loss of vision from age 10. At present, he does not even have 'light perception'. He is from a village 90 kilometres from Dhaka, the capital of Bangladesh. He completed his primary and secondary levels of education at a residential school for visually impaired learners.

After passing his Secondary School Certificate Examination, Ahmed returned home from where he completed his higher secondary education. At home his parents provided him with a desktop computer with screen reader software – 'Job Access with Speech (JAWS)'.

After successfully graduating, Ahmed enrolled at the University of Dhaka. He now lives in an on-campus residential hall for general students. He spends his spare time social networking and reading online articles on issues related to people with disabilities. He started using technology for studying while he was in school; audio recording lectures on cassette tapes, and asking friends to dictate course materials that were not available in Braille onto cassettes. From the age of 14 he has owned a mobile phone that could be used for both phone calls and sending text messages. As he has had no eyesight, he could not read text messages.

During his higher secondary schooling Ahmed used a multimedia cell phone with 'Talks' screen reader software. Ahmed used this software for sending/reading text messages, identifying callers, browsing the internet and accessing Facebook. This multimedia phone was Ahmed's main mode of studying throughout his secondary education.

From two months prior to this interview, he has been using a fifth-generation laptop also equipped with JAWS. During the last three years he has been using an Android phone with the most up-to-date screen readers like 'Talk Back' and 'Shine Plus'.

Case 2

Iftikhar is a visually impaired student. He was born in a village located in the Mymensingh district. The problem with his eyesight was observed from his birth. During his childhood he could only see objects that were placed close to his eyes. At that time his family members did

not pay attention to his eyesight problems. Years later he was taken to a doctor who told him he had problems with his retina.

The ophthalmologist suggested necessary surgeries along with the use of high-powered spectacles. This specialist also said that, if his instructions were carried out properly, the problems would gradually decrease and eventually Iftikhar would have no more trouble with his vision. But Iftikhar's family did not follow any of this advice, whether this was because they were unaware or ignorant, he is not sure.

Later, in 2000, when he was taken from his village for treatment at an eye hospital in Dhaka, he was prescribed with powered sunglasses and was advised to adjust the power on a regular basis. But, Iftikhar's family did not go through his 'follow-up' routine regularly. He had used the same sunglasses carrying the same lenses for 6 years constantly without any follow-up or revisions to the script used for the lenses. With the help of the sunglasses he could see a little – but only nearby objects. He could not see objects that were further away. If he needed to read something, he had to move it very close to his eyes.

At this time Iftikhar realized that his eyesight was slowly getting worse. Then, when taken to another eye hospital, he was informed that LASIK laser treatment could not be performed before he turned 25. Doctors also said that treatment in any developed country instead of Bangladesh would be of no use at that stage. Iftikhar had discontinued using powered lenses after 2008. By that time, the sunglasses were ineffective as his perception of light had reduced significantly. His elder brother had the same problem, but it was not as severe as Iftikhar's condition. His brother was provided with sunglasses in time before his eyesight worsened, and LASIK treatment (which was found elsewhere), which prevented his eyesight from getting as bad as Iftikhar's.

During his school years, Iftikhar could read books by holding them close to his eyes without the help of the powered sunglasses. He had learned using Braille while he was in school. Besides this, he used audio recordings to assist him in his studies. He used to sit for the exams by himself without help from any scribe or sighted writer. Later, when Iftikhar gained admission into his undergraduate studies in History at the University of Dhaka, he could read headlines from newspapers, and large-font print in books, by bringing them close to his eyes. However, he also depended on Braille as well as audio recordings for his academic learning.

In 2009, when Iftikhar was in the second year of his higher secondary education, he started using a mobile phone. That phone could be used for talking, sending text messages, and it

had a limited capacity for audio recording. Subsequently, at university he bought an expensive phone with more configurations. 'Talks', screen reader software, could be used on this phone.

Three months prior to this interview, Iftikhar had bought an android smartphone. In addition, he had received a laptop from an organization although he had not used a computer before. After receiving the laptop, he also received training on using computers and laptops from an organization.

At the time of his interview, Iftikhar had been a student of History at the master's level. He was shy about this, due to a lack of confidence because of his poor vision, and because he needed to take leave from his studies on several occasions. As a result of these breaks in his studies, his academic career extended longer than others of a similar age. When asked, Iftikar did not want to give his age.

Case 3

Shahdat has congenital visual impairment. He can only see light. He cannot even remember if he could ever see properly, but his parents told him that when he was young he could collect coins from the floor if thrown towards him. His parents took him to many places for treatment. Later, a medical team from Japan informed them that the problem Shahdat had been suffering from was incurable. From this point his parents stopped trying to find help for him.

He has passed his School Secondary Certificate Exams from an integrated school that was located just beside the hostel he lived in, which was run by the Directorate of Social Welfare of the Government of Bangladesh. At this school, initially Shahdat's teachers were uncertain that he would be able to continue studying with his kind of visual impairment. Later, after he came first in his exams, the teachers changed their attitude dramatically.

He used to read and write with the help of the Braille system. As none of his teachers were capable of using the Braille system, one of the other teachers who was adept in using Braille, used to read out Shahdat's exam scripts to his course teachers. Based on listening to this, his scripts were evaluated. During his years of schooling, Shahdat was assisted by a visually impaired teacher who would convert all the necessary study materials into Braille for him.

After achieving a good result in the School Secondary Certificate Examination, he moved to Dhaka, for his Higher Secondary studies. Then he was confronted with a major problem – the scarcity of books in Braille. School textbooks converted to Braille were mostly provided by NGOs (non-government organizations). However, obtaining Braille textbooks for college (senior secondary education) was quite challenging. Instead, in college he started using technology for his study: this was in the form of an MP3 Recorder. He developed the habit of audio recording the class lectures, and getting assistance in recording books and other learning materials from their hard copies, and then listening to these.

Afterwards, he started using a laptop when he enrolled in the Department of International Relations at the University of Dhaka. He also began using different types of screen reader software such as Optical Character Reader (OCR) which he collected from senior visually impaired learners living in the same hostel where he lived. At present he considers himself as 'Totally Technology Dependent'.

Case 4

Humayun is a 20-year old visually impaired young man studying for a Bachelor of Education at the Department of Special Education in the Institute of Education and Research, the University of Dhaka. At present he is in the third year of his undergraduate program.

According to him, he has congenital cataracts in his eyes. One of his brothers has a similar eye problem. His parents are cousins. He believes this "inbreeding" is the cause of his eye issue with the cataracts. Humayun said he learned that the offspring of parents with blood connections are likely to bear disability and other congenital complications. When he was six months old he was taken to an ophthalmologist for eye treatment. But the doctor told his parents that he should have been treated earlier if they hoped for a cure. Later, as suggested by the ophthalmologist, surgeries were performed on both of his eyes. Currently he is able to see a little, (for example he can see the shape of a person, move around in daylight, see some larger objects, etc.) but he cannot see things at a distance, or smaller objects. He cannot see something as small as writing. He is even unable to read the headlines in newspapers. Considering these factors, he sees himself as having a "low vision" problem.

Humayun used to receive his education in a residential school away from his home. For this reason, from the 7th grade at school he owned a cell phone which was used only for talking to his family members. He had to get the text messages read out by someone with eyesight, as

his phone did not support any sort of screen reader software, which was troublesome for him. Afterwards, during his higher secondary years, he bought an advanced mobile phone that supported screen reader software. When he started going to university, he bought an even more efficient cell phone that allowed him to use the internet independently and perform online activities. Besides this, he could also record the lectures given in his classes. However, it was not possible to read Bengali on that phone. Eventually Humayun bought an android handset which was more up-to-date and useful than the previous phones he had used. The most significant advantage he has been enjoying from his latest android phone is the support it provides for reading and writing in Bengali.

Humayun used computers independently for the first time when he was a first semester student at university. A non-government donor agency had provided laptops to some visually impaired students who had achieved good academic records, and he was one of these. As he had been trained to use computers during his higher secondary studies, it was easy for him to learn to use the laptop by himself. He also accepted assistance from others when it was needed.

Case 5

Nazat was in the second of a four-year undergraduate International Relations program at the University of Dhaka. She is a visually impaired student who lost her eyesight completely at the age of thirteen months after contracting meningitis. At that time, doctors informed her family that due to the damage in her optic nerve, her blindness would be permanent.

Nazat had started her academic life at a missionary school for girls with visual impairment. There she learned to read and write using the Braille system. Up to the 8th Grade, she had studied in the same school as other visually impaired students. For her 9th Grade studies she was enrolled in an integrated school where she passed her Secondary School Certificate examinations. Then she managed to be accepted to one of the best colleges in Bangladesh for her Senior Secondary years.

She continued her studies using Braille books and audio recordings. She used to use Perkin's Braille machine so that she could write. At this time, she started using a mobile phone for communication, which supported the 'Talks' screen reader software. At the same time, she used the phone for recording various study materials.

She was given an android Smartphone when she enrolled at university. By that time, smart phones were readily available, and she had come to realise that these were being used by other visually impaired students. Her family had bought her an iPhone from overseas. Considering the easy user interface and availability of applications, she and her family had decided on an android smartphone. Along with the mobile phone, Nazat currently uses a 2nd generation laptop and a scanner. She had no experience using computers until she started using this laptop after enrolling at university.

Case 6

Tamanna is another student with visual impairment. In 1995, at the time of her birth, her mother did not identify any problem in her vision. When she was only six months old, however, another woman frightened her mother when she said that it seemed like Tamanna might have problems with her eyesight. Her mother took her to an ophthalmologist who told her that Tamanna's eyes were responding to an allergic reaction, but that this could be cured by medicine. As she was so young at that time, the doctor suggested no further treatment, just the medicine. Tamanna's parents told her that throughout this time she was able to see a little, but the medicine didn't help, and her eyesight gradually worsened.

She was taken to the doctor again. This time the doctor explained that there were problems in the rear part of her eyes. Tamanna could not remember the medical terminology for her problem during this interview. The doctor went on to explain that the condition was not curable in Bangladesh, and had suggested to her parents that they take Tamanna abroad for better treatment. But, as the doctor could not ensure she would be cured if she was taken abroad, her parents did not do so. As a result, Tamanna lost all vision. At present, she has the perception of light only; she can perceive only an obscure shadow if a person or object is very close to her.

Tamanna began her educational life at a missionary school for blind girls in Dhaka. At that time, she had to read by using the Braille system only. Besides this, she used to record necessary things with a tape recorder. But her usage of the tape recorder was very limited as cassettes were extremely expensive at the time. She used to write down her class lectures using Braille, and she used Braille slates to write in her exams. After her classes she would continue her studies from her school hostel.

For the 9th grade she was admitted to an integrated school where she passed her Secondary School Certificate Examinations. Later, for the 11th grade, she got herself admitted to another college and passed her Higher Secondary Examinations from there. Then she was admitted to the Bachelor of Education program at the Department of Special Education in the Institute of Education and Research, University of Dhaka. Her admission was in the reserved quota for students with disabilities. Recently she completed her 2nd year final exams. After passing the Secondary School Certificate examinations, Tamanna started using a mobile phone for the first time in her life, but it was a feature phone capable of voice and text communications only. That phone did not support any applications designed for people with visual impairment. However, with the help of that phone, she would study by recording the class lectures, and books read out loud to her by friends and classmates.

At this time she knew that many of the students with visual impairment used to study with the help of a smartphone. She realized that such a device would be of great assistance to her, so she started saving money in order to buy a smartphone one day. When her Higher Secondary Certificate examinations were over, she attended computer training, where for the first time she learned how computers could be used by a person with visual impairment. After getting admitted to the University of Dhaka, Tamanna participated in an essay competition arranged by an NGO. As a prize for the essay competition, she was given a laptop which was the first one for her, ever. She had never before had personal use of a computer. Besides this, two months before her interview she had bought an android mobile phone. Although she has not yet become adept at using her cell phone, she hopes it will soon enrich her studies and her lifestyle.

Case 7

Selim is a physically challenged student, with the right side of his body being paralysed. In his case it is not a congenital problem. When he was only seven and a half-months old, he accidentally fell to the floor. At first the person who dropped him told no-one in his family about it. After this accident, Selim lost his ability to move his limbs and started crying continuously. After this continued for several days his anxious parents took him to the doctor. The physician informed then that Selim's fall had resulted in internal bleeding in the brain. If Selim had been provided with first aid and taken to the doctor in time, his damage would not have been this extreme.

Until Selim was 3 years old, he could not move at all and would always just be lying down. Afterwards, he started moving around and walking a bit. At present, he does everything with his left hand only. If further support is required, he uses his right hand but just a little. He can do almost nothing with his right hand and right leg. He limps a little while walking. Sometimes saliva spills out of his mouth and he 'stutters' a bit when attempting to talk fast. But he does not need to use any crutch or other assistive device.

In school, Selim had been abused by his classmates for his disability. Even his teachers did not pay attention to him much. But, when he started achieving good results, everyone started being positive towards him. Obtaining good results at school and college levels, Selim has been studying his 2nd year in the undergraduate program of Psychology at the University of Dhaka. He lives at a hall in his university. He gained enrolment at the university on the basis of merit, not through a quota for people with disability. He has never collected any certificate for his disability. He has completed his entire school and higher secondary education with non-disabled students. He could have accepted assistance from writers or scribes because of his paralysed hand, but he never did so. He is capable of writing like other non-disabled learners with his left hand. But writing like this is slow as the paper he writes gets displaced due to his incapacity to hold it with his right hand.

Selim uses various devices and software like non-disabled persons do. After he obtained very good results in his Secondary School Certificate examinations, his uncle (maternal) sent a laptop to him from abroad. Again, when he acquired good results in his Higher Secondary Certificate examinations, another uncle sent him an android mobile phone as a gift. But his parents did not let him use that phone. (He used to go to his college from his home where he lived with his parents). His parents used to think that Selim did not need to use phone while living with them. Later, when he moved to Dhaka to attend coaching for admission to the universities, he was bought a cheap cell phone that could be used for talking and texting only. After gaining a place at university, he started living in a hall where he was able to use the phone that was a gift from his uncle. He used to use his laptop for his college studies, although it was limited to playing games, using Facebook, and searching for something on Google. At present he uses both his android mobile phone and laptop.

Case 8

Utpal is now in the 4th year of his undergraduate course on Management at the University of Dhaka. He is a student with a physical impairment. From the time of his birth, his hands and legs were flipped (facing the opposite way to what was 'normal'). He was taken to India five times for treatment, with the last treatment being in 2008. Surgeries were performed on his legs to bring them to the normal position. The doctors had told him that as he grows older his hands and legs will become stronger. Utpal thinks that gradually his hands and legs are getting stronger. At present, he can do his chores by himself, can walk at almost normal pace, and he can write fast also. He just cannot grip anything firmly or pull it with his right hand. His left arm is stronger than the other. For this reason, he writes or lifts things with his left hand.

Utpal started going to school at his village. Obtaining a GPA 5 result in the Secondary School Certificate Examinations, he was admitted to a college in Dhaka. After completing his higher secondary education at the college, he was enrolled at the University at Dhaka in a merit position of 463rd.

In the seventh grade, Utpal was given a digital device, which was an iPod. However he could use this only to listen to music. After passing Secondary School Certificate examinations, he had bought an MP4 player to watch videos. Besides this, he could play games on it. Although mobile phones were used in his family (from when he was a young child), Utpal was able to have a cell phone for his personal use only after he was admitted to his Higher Secondary College in Dhaka. He was given this phone so that he could communicate with his family members. He used his phone also for listening to music, watching videos, and downloading from the internet. But that phone had no touch screen feature.

After being admitted to university, Utpal bought an android Smartphone. With his new phone, he started using Facebook, continued browsing the internet, created an e-mail ID, and initiated communication with his old friends. In 2013, during his first year at university, his father bought him a 2nd generation laptop. He explained that he used his phone and laptop for three significant purposes – communication, recreation and education.

Case 9

Sagir was born with an undersized and flipped right leg. No-one else in his family had this kind of problem. He was born in a village called Ruppur in the district of Barisal. Due to

financial crisis, his father could not arrange for the treatment of Sagir's flipped leg. When he was in his 4th grade at school, his mother died. After her death, his grandmother (maternal) took him in. He had been told that, with his mother dead, his grandmother feared he would not receive proper care. For this reason, she took care of him and got him admitted to another school, a school nearer to her house. When he was in his 7th grade at school, a 'floating' charity hospital visited their locality. His grandmother took him to that hospital and arranged for the necessary surgeries to be done. If those surgeries had been performed earlier, he mentioned, his condition would have improved long ago. After the surgeries, his flipped right leg improved a bit, but since then it has become a lot thinner than before. Moreover, he has almost no strength in that leg. The leg also aches after walking for a long time.

Sagir had studied in the general schools and colleges with non-disabled students. Passing his Higher Secondary examinations, he got himself enrolled in the undergraduate program in the Department of Management Information Systems at the University of Dhaka. He had been in the third year of his study there when this interview was conducted.

The first mobile phone that Sagir owned was merely a feature phone that could only be used for making voice calls and SMS services. Later, after admission to university, he bought a Smartphone for his internet browsing as well as other online activities. Although he had received a training computer when he was at college, he has no computer of his own. He uses the computer lab in his department at university for his study purposes. If he is badly in need, he uses laptops belonging to his friends. He is quite eager to get a laptop of his own to use at his convenience.

Case 10

Sujata is a student with speech impairment. She was studying in her first year in the Department of Banking and Insurance at the University of Dhaka. She was born with a cleft lip and at six months she was taken to Dhaka, the capital of Bangladesh, for surgery. After the surgery, she grew up to speak like a normal child, although she said she had been told she had been slower in speech development than others of her age. Although she could speak properly, her pronunciation was never clear. She has a dry hoarse voice that sometimes sounds extremely nasal. No one else in her family has cleft lip.

The school and college Sujata had studied in were for non-disabled students. She never had to face that much trouble because of her impairment. She just needed longer to adjust to any new environment with new friends and classmates, as well as teachers.

After passing her Higher Secondary Certificate examinations, Sujata started going to a university admission coaching centre that was away from her village. At that time, a feature phone was bought for her for basic communications. With that phone, she used to talk to her family members only. Even after being admitted to university she used that phone. Six months prior to this interview, her family bought her a smartphone to assist her with her studies. Almost at the same time, she was given a laptop so that she could learn to use a computer. At present, she is attending a computer training course to learn the basic skills of computer operations.

Appendix VII: Sample coding

প্রশ্নকর্তা: আচ্ছা, তারমানে তোমার চ্যালেঞ্জ এইটাও বটে যে তোমার আগে কেউ ...মেয়ে....ব্লাইন্ড ...ব্যবহার করে নাই। ফলে এইটাও তোমাকে বাধা দিচ্ছে ...ইন্টারনেট ব্যবহার করার জন্য।

উত্তরদাতা: হ্মি। 41:14

প্রশ্নকর্তা: এমনিতে যে তুমি কম্পিউটার বা মোবাইল ব্যবহার করো এইটাতে কোন অসুবিধা নাই তো? এটাতে কোন বাধা নাই তো?

উত্তরদাতা: না এটা তে কোন বাধা নাই।খালি হেডফোন ইউজ করলেই হইছে। কারণ রুমমেটদের....যেহেতু সবসময় কথা বলতে থাকে ....আগে যদি হেডফোন ছাড়া ইউজ করি তাহলে রুমমেটদের প্রবলেম হয়। এই ক্ষেত্রে আমার হেড ফোন ইউজ করতে হয়। আবার সারাদিন হেডফোন কানে লাগায় রাখতে রাখতে মাথা ব্যথা হয়ে যায়, কান ব্যাথা করে। এটা আরেকটা চ্যালেঞ্জ।41:40 *(margin: Adjustments. / E/C.)*

প্রশ্নকর্তা: আচ্ছা আচ্ছা, মানে শারীরিক ভাবে ও তুমি অসুবিধায় পড়ো...এই কানে দিয়ে রাখার জন্য।

উত্তরদাতা: হ্যা, অসুবিধায় পড়ি....

প্রশ্নকর্তা: যেহেতু এটা শদ্দ করে ...কানে দিয়ে রাখার জন্য।।...এটা ভালো বলেছো।এটা ও একটা বাধা বটে। তুমি ইউনিভার্সিটির সুযোগ সুবিধা সম্বন্ধে যদি একটু বলো... কী সুযোগ সুবিধা পাচ্ছো টেকনোলজির জন্য ইউনিভার্সিটি থেকে? তুমি ?

উত্তরদাতা: আআ.... আমি ব্যক্তিগত ভাবে কোন সুযোগ সুবিধা পাচ্ছি বলে তো মনে হয় না। কিন্তু..আআ.... হ্যা, ওয়াইফাই একটা ফ্রি ওয়াইফাই আছে। যেমন আমাদের ডিপার্টমেন্টও আছে। তো এই জিনিসটা ...আসলে এটা...আমিই পারি নাই হয়তো কাজে লাগানোর জন্য। ...এটা আমার...আমি পারি নাই। এইটুকু সুযোগ আছে। 42:17 *(margin: Provision.)*

প্রশ্নকর্তা: তুমি পারছো না কেন ? এটা কি তুমি কখনো ভেবেছো?

উত্তরদাতা: হ্যা, ভেবেছি কারণ আমার পারার মত...এটা... কখনো ছিল না। আমার স্মার্ট ফোন ছিলো না, আর ল্যাপটপ ..ওইখান থেকে নিয়ে আসা....আ....আর দুই বছর হয়ে গেছে...ল্যাপটপের অবস্থা ও খারাপ। এখন এই কারণে ও হয়তো বা নেট কানেকশন পেতে সমস্যা হয়, অনেক ঝামেলা হয়। আরেকজনের হেল্প লাগে। তো এই কারণেই আর কি....অই ভাবে ...ইচ্ছা করে..অই ভাবে ল্যাপটপ নিয়ে আসো , তারপরে ট্রাই করতে করতে হয়তো কানেক্ট হলো না হয় হলো না। বিভিন্ন কারনে আর কি করা হয় নাই। 42:50 *(margin: E/C / E/C.)*

প্রশ্নকর্তা: ইউনিভার্সিটি থেকে তাহলে তুমি তাহলে ওয়াইফাই ছাড়া ...ফ্রি ওয়াই ফাই ছাড়া তোমাদের কোন ট্রেনিং বা কোন ডিভাইস দেয়া এরকম কোন সুযোগ সুবিধা তুমি পাও নি?

উত্তরদাতা: না না। অইরকম ভাবে আসলে হয় নি।

প্রশ্নকর্তা: বা হলেও তোমাদের জন্য আসলে ...যারা দৃষ্টি প্রতিবন্ধি তাদের জন্য কোন সুযোগ নাই ?

উত্তরদাতা: কোন সুযোগ নাই। মানে একটা সাধারণ মেয়ে যেভাবে থাকবে ,আমার জন্য ও সেভাবে। কোথাও যদি ....আ....এই যে সামনে পহেলা বৈশাখ আসতেছে ওখানে আমাদের হলে খাবার দেয়ার আয়োজন করে। তো সেইখানে এরকম হয় যে....আ... অনেক জায়গায় আমি দেখেছি, যে, যারা দৃষ্টি প্রতিবন্ধি থাকে বা যারা অন্য প্রতিবন্ধি থাকলে ওদের কে লাইনের আগে দিয়ে ছেড়ে দেয়। কিন্তু এই হলে এসে আমরা পর্যন্ত ঘন্টার পর ঘন্টা লাইনে দাঁড়ায়া থাকি...থেকেছি। 43:34 তারপর... কোন স্পেশাল সুযোগ সুবিধা ..আ....আমি এখন পর্যন্ত পাই নাই। *(margin: No Provision)*

প্রশ্নকর্তা: টেকনোলজির জন্য তো না ই ....?

উত্তরদাতা: না।.. একদম

প্রশ্নকর্তা: এটা তো শুধু হল না, বিশ্ববিদ্যালয়ে ও তুমি পাচ্ছো না ?

উত্তরদাতা: না।

প্রশ্নকর্তা: বিশ্ববিদ্যালয়ে একটা রিসোর্স সেন্টার আছে, লাইব্রেরিতে। তুমি কি সেটা জানো? 43:48

উত্তরদাতা: হ্যা, জানি।

প্রশ্নকর্তা: তাইলে তুমি গিয়েছো কখনো?

উত্তরদাতা: গিয়েছি।

প্রশ্নকর্তা: ওখানে থেকে কোন সুযোগ সুবিধা পাও?

উত্তরদাতা: ওখানে..এএ.....হ্যা, পাওয়া যায়...আ.... ওখানে গেলে ব্রেইল লিখা যায়, তারপরে আমি কাউকে দিয়ে রেকর্ড ও করতে পারি। তবে স্যার ওখানে একটা প্রবলেম হলো ...আ... ওখানে কোন..আ... মেয়ে নাই। ওখানে সব ছেলেরা আছে। এই কারণে আমার ...বা আমার মত যারা আছে উনারা যেতে একটু ...আআ....

প্রশ্নকর্তা: অস্বস্তি বোধ করেন?

উত্তরদাতা: হ্যা, অস্বস্তি বোধ করেন...ভালো লাগে না। এই জন্য আমরা আসলে ...যাওয়া হয় না। 44:16

প্রশ্নকর্তা: যাওয়া হয় না .... হম .. তার মানে ওই অফিসটা থেকেও তোমরা ঠিক মত সুযোগ সুবিধা পাচ্ছো না।

উত্তরদাতা: তেমন একটা না...

প্রশ্নকর্তা: কোন সুযোগ সুবিধা কি পেয়েছ? একটা হলেও?

উত্তরদাতা: আআ....হ্যা..যেমন আমি প্রথম ... যখন এসেছি...যখন অই ব্রেইলে লিখতাম, তখন অই লাইব্রেরিতে বসে বসে লিখতাম। অই....ইয়ার মাধ্যমে... ভয়েস রেকর্ডারের মাধ্যমে আর কি। শুনে শুনে লিখতাম।

প্রশ্নকর্তা: তোমার ভয়েস রেকর্ডার নিয়ে যেতে?

উত্তরদাতা: আমার।

প্রশ্নকর্তা: শুনে শুনে তুমি হাতে লিখতা ? 44:41

উত্তরদাতা: হ্বি।

প্রশ্নকর্তা: কারণ ওখানে কাগজটা পাওয়া যেত?

উত্তরদাতা: পাওয়া যেত...হ্বি। আর কাগজ তো বাইরে পাওয়া যায় না। লাইব্রেরিতে যেত। আর ওখানে ভালো..আআ.... ঠান্ডা ...আআ.... এয়ার কন্ডিশন আছে। মানে এইদিক দিয়ে একটু সুবিধা। তাও মনের ভিতর একটা ভয় লাগে। কারণ কোন মেয়ে নাই। ওখানে সব ভাইয়ারা। যেতে ভালোলাগে না। 45:04

প্রশ্নকর্তা: ওইখানে তো ইন্টারনেট লাইন আছে ?

উত্তরদাতা: ...এএ ....সম্ভবত আছে। আমি ওখানে ব্যবহার করি নাই আমি ব্যবহার করি নাই, আমি কাউকে ব্যবহার করতে ও দেখিনাই।

প্রশ্নকর্তা: দেখো নাই ?

উত্তরদাতা: না।

প্রশ্নকর্তা: আচ্ছা আচ্ছা। তুমি ..আআ.... তোমার টিচারদের কথা বল, যে তোমার টিচার রা কি তোমার টেকনলজির ব্যবহারের ব্যাপারে বা তোমার জন্য যে একটু বিশেষ কিছু দরকার.... যেমন, তুমি একটা রেকর্ডার ব্যবহার করো যদি, বা মোবাইলে রেকর্ড করছো... তাদের অনুমতি আছে কিনা? তারা কি সহায়ক ? নাকি ... তারা কেমন ভূমিকা পালন করেন ? 45:31

উত্তরদাতা: টিচাররা এই ক্ষেত্রে আমি বলবো অনেক ...অনেক সহায়ক। কারন...আআম.... এমনও হয়েছে রেকর্ডার দেই নি তখন পড়ানোর আগে বলতেছে, 'এই তুমি রেকর্ডার নিচ্ছো না কেন, পড়া তো শুরু করবো। এরকম যেমন ঘটনা আছে, সেরকম আরেকটা ঘটনাও আছে যে, একজন ম্যাম.. আমরা রেকর্ড করবো বলে তার নাকি বিরক্ত লাগতেছে। তো পরবর্তিতে একসময়.... বহত থারাপ লাগলো। আর আমার যতদূর মনে হয় ,আমাদের মত যারা ...আমরা মনে হয় একটু..আ.... মানে..বেশি একটু রাগী বা অল্পতেই একটু কষ্ট পাই। এটা বুঝি যে , এটা অল্প বিষয় তারপরে খুব...থারাপ লাগে...আ... কষ্ট পাই। তো এই কথা শোনার পর না

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অনেক কষ্ট লেগেছিলো যে, উনি বলেছিলেন যে আমার এসব পছন্দ না । এই সব রেকর্ড করা মানে হচ্ছে আম্মাকে বন্দি করা। এই সব ঠিক না। তো তারপর থেকে আমি উনার ক্লাসে রেকর্ড করতে দিতাম না ।   46:27

প্রশ্নকর্তা: আম্মাকে বন্দি করার ব্যাখ্যা টা কী দিয়েছিলেন ?

উত্তরদাতা: উনি তেমন কিছু বলেন নাই। জাস্ট এই কথা টাই বলেছিলেন যে, 'এটা আম্মাকে বন্দি করা হয় কারণ আমার কথাগুলো অইখানে রেকর্ড হচ্ছে...এই বিষয়টা কেমন না !!'   উনার কাছে এরকম একটা ব্যাখ্যা ছিলো।

প্রশ্নকর্তা: আর সহপাঠি দের কথা বলো... সহপাঠিরা তোমাকে সাহায্য করে টেকনোলজি ব্যবহারে? যারা দৃষ্টিমান সহপাঠি? 46:43

উত্তরদাতা: ওরা..আ....হ্যা, ওরা অনেক সময় দেখা যায় যে আমরা যদি দূরে বসি বা ..আ..... কখনো দেখা যায় যে, ..এএ... টিচারের সামনে .... টিচার পড়া শুরু করে দিয়েছে ...টিচারের তো সবসময় মনে থাকে না যে...ও ডিভাইস দেয় নি। তখন ওরা অনেক সময় দৌড়ে দিয়ে আসে , যে রেকর্ড করতে হবে ... দিয়ে আসে। আবার ওরা ও অনেক সময় দেখা যায় যে আমাদের মোবাইলে চার্জ না. থাকলে ...ওরা ও অনেক সময় রেকর্ড করে । ওইটা আবার পরে আমাদের কে দেয় ।

প্রশ্নকর্তা: ওও, ওরা চার্জ ...ইয়ে...রেকর্ড করে তোমাকে দেয়...?

উত্তরদাতা: আমাকে...আমাকে দেয়। 47:11 এই ভাবে হেল্প করে...ওরা।

প্রশ্নকর্তা: তুমি কি একটা ঘটনার কথা বলতে পারো যে, তোমার টেকনোলজির চাহিদা যেটা ছিলো সেটা বিশ্ববিদ্যালয়ে মিটতেছে? অথবা মিটে নাই? যে আমার এই দরকার টা ছিলো টেকনোলজিক্যাল, কেউ আমাকে মিটিয়ে দিতে পারে নাই? অথবা মিটিয়ে দিয়েছে?

উত্তরদাতা: উমম....নাআ.... মিটিয়ে দিতে পারে নাই, কারণ আমি তো চেষ্টা করছি, কিন্তু পারছি না। যেমন আমার সেই এসাইনমেন্টের কথাই মনে হয় বার বার যে আসলে.... আমার ওখানে দশ মার্ক ছিলো। আমি এখন পর্যন্ত ভুলতে পারি না আসলে এই জন্য আমার ..আ.. অইখানে (অই কোর্সে) মার্কস কত আসবে সেটা মোটামুটি একটা চিন্তার বিষয়। তো আমার এই জিনিসটা ...আমার..আআ.... 47:52

প্রশ্নকর্তা: তুমি কোর্স টিচারের সাথে কথা বলতে যাও নাই এই বিষয় টা নিয়ে ? যে আমি কিভাবে করবো? আমাকে তো কেউ সাহায্য করছে না।

উত্তরদাতা: নাআ.... আমি ...সাহায্য করছে না বলে আমার মনে হয় , আমার ফ্রেন্ড রা যদি কখনো শুনে ...আমি বলি ..যে ও হেল্প করতেছে না ..তখন ওরা আবার কষ্ট পাবে। আর তাছাড়া স্যার কে বললে স্যার কাউকে ডেকে বলবেই যে, তুমি.... তোমরা কেউ করে দাও ওকে। হ্যা এরকম এক ম্যাডাম বলেছে কিন্তু করে দেয়া ..আআ... মানে করে নাই আর কি...। 48:17

প্রশ্নকর্তা: আচ্ছা। বলে দেবার পরে ও ঐ কোর্সে করে নাই?

উত্তরদাতা: না। ম্যাম বলছে, তারপরও করে নাই।

প্রশ্নকর্তা: আচ্ছা। এইটার পিছনে কারণটা কী ? এটা কি তাদের উদাসীনতা? নাকি ? আর কী কারণে তারা না করতে পারে বলে মনে হয়?

উত্তরদাতা: আমার মনে হয়, উদাসীনতাই হচ্ছে সবচেয়ে বড় কারণ। আর তারপরে হচ্ছে ...আআ....নিজেকে নিয়েই খুব ব্যস্ত থাকে ওরা। আমার মত তো ওরা ....শুধু তো ....(একটু হেসে) আমি তো সারাদিন রুমে আর ...মানে ডিপার্টমেন্টে। এছাড়া তো আমার আর .... আর ওদের তো বন্ধু-বান্ধব, তারপরে ওদের নিজের পড়াশোনা আছে। তারপর সব কিছু মিলে.... আর একজন মানুষ নিজের টা যেভাবে করে , অন্য জনের টা কিন্তু ঐভাবে করে না। আসলে। নিজের তা যেভাবে তাগিদ দিয়ে করে , অন্য জনের টা আসলে ঐ ভাবে করা হয়ে উঠে না। এই জন্য আমার আসলে মনে হয় যে আসলে ঐ এসাইনমেন্টটা করা হয় নাই। 49:03

প্রশ্নকর্তা: তুমি আমাকে সর্বশেষ মতামত দাও। তুমি যেই পরিমানই টেকনোলজি ব্যবহার করো না কেন, তোমার পড়াশোনা এবং জীবন-যাপন এটার উপরে তার প্রভাব টা কেন ? কতটুকু প্রভাব রাখতেছে?

উত্তরদাতা: আমার মনে হয় পুরো টাই টেকনোলজির প্রভাব আমার উপর এখন। কারণ হচ্ছে ..আমার...আ..মানে পড়াশোনা তো অবশ্যই...মানে ..আ.আ... সবখেকে উপরে পড়াশোনা টা। এমন হয় যে আমি একা একা থাকি তো...যখন...এমন হয় যে, রুমের সবাই বাড়ি চলে গেছে আর ..আ..আমার বন্ধু বান্ধবরা তেমন কেউ নাই। আমি একা তখন ও যদি আমার খুব মন খারাপ ও হয় সেই ক্ষেত্রেও ডিভাইস আমাকে হেল্প করে। কারণ আমি তখন হয়তো বা গান শুনবো, অথবা আমি...আ... মুভি দেখবো...আ... যেকোন ভাবেই হোক আমার ওই... ডিভাইসের উপরেই আমার...আআ...লাইফটা এখন হয়ে গেছে। কারণ আমার আনন্দ ও কিন্তু ডিভাইস দিচ্ছে , আমার মন খারাপের সময় ও আমি ল্যাপটপ অথবা মোবাইল ইউজ করছি। আবার পড়াশোনার সময় ও আমি ঐ...আ...মোবাইলই ইউজ করছি। 50:09

প্রশ্নকর্তা: মানে তোমার তোমার মনও ভালো করে দিচ্ছে আবার তোমার পড়াশোনার ও কি উত্তরণ ঘটছে ? বা তুমি কি মনে করো, ডিভাইস গুলো ব্যবহারের করার পর থেকে তুমি পড়াশোনাতেও....কিছুটা হলেও ভালো হচ্ছে তোমার?

উত্তরদাতা: হ্বি হচ্ছে। কারণ নইলে আমি এখানে...আআ..... থাকতে পারতাম না। আরো অবস্থা খারাপ থাকতে পারতো।

প্রশ্নকর্তা: হ্যা। রাইট। ভালো হয়েছে সেটা তুমি কিভাবে বুঝ? কী কী দেখে বুঝ?

উত্তরদাতা: আআ....

প্রশ্নকর্তা: ভালো হয়েছে সেটা তুমি কিভাবে বুঝ ? কী কী দেখে বুঝ যে ভালো হয়েছে?

উত্তরদাতা: আআ.... সেমন বুঝি....পরীক্ষাতা...যেমন আজকের পরীক্ষাটা দিলাম ...এট আআ... আমার কাছে রেকর্ড ছিলো, আমি পড়েছি। যার কারণে আজকের পরীক্ষাটা ভালো হয়েছে। আমি কোন প্রশ্ন ছাড়তে হয় নাই। আমি সবগুলো এনসার করতে পেরেছি। এটাতো এই ডিভাইসের জন্য ই সম্ভব হয়েছে। 50:55

প্রশ্নকর্তা: আচ্ছা, তুমি কি আমাকে আরও একটু বলবা তোমার এখন যে সাপোর্ট গুলি বিশ্ববিদ্যালয় দিচ্ছে না , তুমি টেকনোলজিক্যাল আর কী কী সাপোর্ট বিশ্ববিদ্যালয় থেকে চাও ..যে আমাকে এটা দেয়া উচিত, আমার জন্য এটা ভালো হত?

উত্তরদাতা: আআ....

প্রশ্নকর্তা: যে সুবিধাগুলি তুমি এখন পাচ্ছো না ... কী এমন তুমি চাও টেকনোলজিক্যাল সুবিধা যেটা পেলে তোমার ভালো হয়? 51:18

উত্তরদাতা: আআ... যেমন, আমাদের কোন কিছু হলে বড় ভাইয়াদের কাছে যেতে হয়। আআ..তো.. আমাদের ..মানে বড় ভাইয়ারা তো সবসময় ফ্রি থাকেন না, উনারা ব্যাস্ত থাকেন, উনাদের পড়াশোন নিয়ে ...ত আমাদের তো লাইব্রেরি আছে, সেখানে যদি ..আআ... আমাদের কোন প্রবলেম হলে ল্যাপটপ অথবা মোবাইলে...সে ব্যাপারে যদি আমরা একটু হেল্প পেতে পারি...আআ...একটা রিসোর্স সেন্টারই হোক আর যেখানেই হোক, যদি আমরা হেল্প পেতে পারি...এরকম যদি একটা কিছু করা যায় ...একটা হেল্প সেন্টারের মত ... তাহলে আমার মনে হয় আমাদের ভালো হতো। যেমন আমি স্ক্যানার এখনো ইউজ করতে পারি না। এরকম যদি একটা ..আ... তথ্য কেন্দ্র ও থাকতো তাহলে তাদের কাছে আমি নিশ্চয়ই জানতে পারতাম যে কিভাবে এটা ইউজ করতে হয় বা কেমন করে পারবো। এটা একটা । আরেকটা হচ্ছে, ...আমার..আ... টিচার যারা...আমার যে হলে যারা প্রভোস্ট ম্যাম, তারপর হাউজ টিউটর ...উনাদের কে যদি একটু বুঝালো যেত যে, ...হ্যা, আমি নতুন হই বা আমার আগে যে কেউ এই আআ.... ব্রডব্যান্ডের জন্য আবেদন করুক না কেন, তারা দিবে, তারা জানে...যে হ্যা, ওর প্রয়োজন ... ওর ও লাগতে পারে । এই জিনিস গুলা কে বুঝাবে? এরকম যদি কেউ একজন থাকে যে, আমাদের প্রবলেম হলে বা আমাদের কোন প্রয়োজনে...এমন যদি কেউ থাকতেন যে আমাদের

প্রয়োজনে,আমাদের হয়ে কথা বলবেন ... তাহলে আমার মনে হয়..আ... সেটা ডিভাইসের ক্ষেত্রেই হোক, আর সে কোন ক্ষেত্রেই হোক সেটা অনেক উপকার হবে আমাদের জন্য। 52:49

প্রশ্নকর্তাঃ রিসোর্স সেন্টারে তাহলে তোমরা এই সুযোগ গুলা পাচ্ছো না?

উত্তরদাতাঃ না

প্রশ্নকর্তাঃ রিসোর্স সেন্টারে এই সুযোগ গুলা তুমি পেতে পারতা...

উত্তরদাতাঃ পারতাম...স্যি।

প্রশ্নকর্তাঃ এটা সৃষ্টি করা হয়েছিলো তোমাদের এই সাপোর্ট তা দেয়ার জন্য। কিন্তু ঐ সেন্টার থেকে সাপোর্ট টা পাচ্ছো না ?

উত্তরদাতাঃ পাচ্ছি না, স্যি।

প্রশ্নকর্তাঃ তোমাদের জন্য ডিসএবিলিটি অফিসার আছে , তাদের কাছে তোমরা কি টেকনোলজিক্যাল কোন সুযোগ সুবিধা পেয়েছো? 53:09

উত্তরদাতাঃ না। এ পর্যন্ত পাইনি।

প্রশ্নকর্তাঃ পাওনি, আচ্ছা ... তুমি তোমার ভবিষ্যত শিক্ষার্থী যারা আসবে.... ব্লাইন্ড ... দৃষ্টিপ্রতিবন্ধি... তাদেরকে ... টেকনোলজি ব্যবহার সংক্রান্ত বিষয়ে কী অভিমত দিয়ে যেতে চাও? তাদের স্বার্থে?যেতা করলে ওদের ভালো হবে টেকনোলজি ব্যবহারের জন্য? 53:32

উত্তরদাতাঃ আমার মনে হয়, আগে আগে যদি এই ডীভাইস গুলা হাতে পায় ওরা... যেমন হচ্ছে...যখন আমার ক্লাস শুরু তখন ই পেয়েছিলাম এই ডিভাইসগুলা। প্রথম দিকে আমার একটু প্রবলেম হয়েছিলো...যে ইউজটা কিভাবে করবো আমি ...একটুও...মানে..এ..দ্বিধা দ্বন্দ ছিলো। তো এই জিনিস তা যদি আমার ধারণা থাকাতো...আগে যদি আমি ল্যাপটপ টা পেতাম, তাহলে আমার ..মানে...আগে ...মানে মানে...আরো...কি বলে...মানে আরো বেশি করে পারতাম আমি, আরো স্পিড থাকতো আমার কাজের মধ্যে। আর তাছাড়া এই মোবাইলটা এখন বেশি ইম্পর্টেন্ট হয়ে গেছে। আর ল্যাপটপ নিয়ে সব জায়গায় যাওয়া আসা কষ্ট। 54:10

প্রশ্নকর্তাঃ কষ্ট... নিরাপদ ও না ...

উত্তরদাতাঃ নিরাপদ ও না... স্যি। এখন এই মোবাইলটা যদি সবার হাতে থাকে...স্মার্টফোন , তাহলে আমার মনে হয় অনেকাংশেই আম....মানে...আমাদের যারা ..আআ...মানে ..ভবিষ্যত প্রজন্ম, ওরা অনেক ভালো করতে পারবে। কারণ আমার একটা মোবাইল কিনতে দুই খেকে আড়াই বছর লেগে গেছে। এই দুই আড়াই বছর আগে যদি আমি মোবাইল টা পেতাম তাহলে আজকে হয়তো আমার..আআ.... ডিভাইসের ব্যাপারে অন্তত কোন অজ্ঞতা থাকতো না। 54:38

প্রশ্নকর্তাঃ তাহলে তাদের কেও তুমি বলছো যত আগে পারে ব্যবহার করতে ...?

উত্তরদাতাঃ স্যি স্যি।

প্রশ্নকর্তাঃ আচ্ছা। ঠিক আছে, তুমি আর কোন বিষয়....আমরা কি মিস করে গেছি যেটা তুমি এখন মনে পড়েছে? বলতে চাও? থাকলে আমরা ....সেটা..আ... বলতে পারো? মনে পরছে এমন কিছু বলতে চেয়েছিলা? আমি তোমাকে একটা জিনিস জিজ্ঞেস করতে ভুলে গেছি সেটা হচ্ছে তুমি কি মনে করো, তোমাদের মত দৃষ্টিপ্রতিবন্ধি যারা বিশ্ববিদ্যালইয়ে পড়ালেখা করছে যারা ছেলে ...আর যারা মেয়ে তাদের ...ছেলে এবং মেয়ে এই দু পক্ষের টেকনোলজি ব্যবহারে কোন পার্থক্য আছে কী? 55:10

উত্তরদাতাঃ অনেক পার্থক্য আছে আমার মনে হয়।

প্রশ্নকর্তাঃ যেমন ?

উত্তরদাতাঃ কারণ হচ্ছে , ছেলেদের..আ... ওরা না চাইতেই ওদের ..আ... ইন্টারনেট কানেকশন ই হোক আর যাই হোক, যে কোন তথ্যের প্রয়োজন হোক, তাদের মধ্যে যোগাযোগটা অনেক দ্রুত হয়।

প্রশ্নকর্তাঃ ছেলেদের মধ্যে?

উত্তরদাতাঃ ছেলেদের মধ্যে। কারণ ওরা হলে খুব কাছা কাছি থাকে । আর অনেকেই....,মেয়েদের তুলনায় ছেলেদের সংখ্যা অনেক বেশি। এজন্য তাদের তেমন কোন সমস্যা হয় না। কিন্তু আমরা মেয়েরা সংখ্যায় অনেক কম। তাছাড়া ...আমরা..আআ...মানে আমাদের... মানে ...বড় কিন্তু কেউ নাই যাদের কাছ থেকে আমরা শুনবো, যাদের কাছ খেকে দেখবো, যাদের কাছ থেকে আমরা শিখবো। তো, এরকম কেউও নাই যার কারনে আমরা অনেক পিছায় গেছি। যেম্ন, আমি যদি এই বিষয়তা জানি তাহলে তো একজন কে জিজ্ঞেস করবো...ভাইয়াকে , যে ভাইয়া এই বিষয়টা কী? কিন্তু আমি যদি নাই জানি তাহলে কাকে জিজ্ঞেস করবো...মানে..আ... কী জিজ্ঞেস করবো। আর সেই বা কী করে বুঝবে আমি এটা জানি না। 56:08

প্রশ্নকর্তাঃ হম....কি জানো না..সেটাই. হ্যা..আচ্ছা।

উত্তরদাতাঃ তো এইটা হচ্ছে একটা বড় গ্যাপ, এই জন্য ই হচ্ছে আমাদের সমস্যাটা বেশি। আমরা যে কোন ক্ষেত্রে একটু পিছিয়ে আছি। 56:18

প্রশ্নকর্তাঃ মানে ছেলেদের চেয়ে টেকনোলজি ব্যবহারের ক্ষেত্রে তোমরা পিছিয়ে আছো?

উত্তরদাতাঃ হ্যা, পিছিয়ে আছি।

প্রশ্নকর্তাঃ এবং এই পিছিয়ে থাকার কারণ কি আরেকট এরকম যে সামাজিক যে আমাদের ..আ...প্রথা যে, মেয়েরা ...এখনো সেভাবে এগিয়ে আসেনি...আসতে পারে নি... ফলে তারা চায়ও নি টেকনোলজি ব্যবহার করতে? ব্যাপারটা কি এরকম? না তারা চেয়েও পারছে না? 56:35

উত্তরদাতাঃ না তারা চেয়েও পারছে না। কারণ হচ্ছে , আমরা অনেকে বার ট্রাই করেছি। আমরা মানুষকে বুঝাতে চেষ্টা করেছি...এখনো পর্যন্ত রাস্তায় বের হলে মানুষ কে বলতে হয় যে, আমি ঢাকা বিশ্ববিদ্যালয়ে পড়ি এবং পড়তে পারি। এখন পর্যন্ত মানুষ জানে না। এখন পর্যন্ত আমাদের প্রভোস্ট ম্যমা বলে যে, তুমি ইন্টারনেট কানেকশন দিয়ে কী করবা? এখানে তো তাদের অনেক বড় একটা ...মানে... অজ্ঞতা আছে। তারা অনেক বড় একটা কিছু কিন্তু..আ...জানে না। আর এই জানে না বলেই তারা আমাদের কে ঐ ভাবে সুযোগটা ও দিতে পারছে না আর আমরাও নিতে পারতেছি না। যার জন্য আমরা আরো বেশি পিছায় যাচ্ছি। 57:12

প্রশ্নকর্তাঃ আচ্ছা। থ্যাঙ্ক ইউ। আমরা আমাদের ইন্টারভিউ এখানে শেষ করছি। তোমাকে অনেক ধন্যবাদ।

Appendix VIII: Data collection instruments

First phase data collection instruments

Tool 1: Interview questions for the disabled students

A. About Yourself

1. Who are you? Where are you from? Tell me about your school and college? Could you inform something about your early university life and experience?

2. What do you currently study at this university? What is the time length of the course you are studying? In which year you are? How often you need to attend classes? What are the other requirements of this course (midterm, final, assignment, tutorial, practical lab, presentation)

3. Describe your disability in your own words (what type/s, age of onset, identification, special needs for living and learning, etc.)

B. Your Technology Usage

Do you use any digital technologies for your living and learning?

Please check mark any or all technologies from the following and answer the specific questions regarding each technology. You can also add more technologies which are not listed here:

☐ Mobile

1. What type of mobile phone you are using (smart phone or normal)? How do you use it? Do you use any software in it? What are the uses of your mobile? Only for daily living or learning/studying also?

2. What application do you use in your mobile (prayer timetable, newspaper,)

3. What are the difficulties to use mobile phone regarding your disability type? How did you overcome/adjust with that? Tell me an incidence from your memory.

4. How did you learn to use mobile phone? Did you have any hesitation/fear to use mobile phone? How did you overcome that?

5. Do you think your mobile phone use is different than student with other types of disability? Please explain if you perceive any difference.

☐ Computer:

1. What type of computer you are using? Is that a desktop, laptop, notebook or any other device? Do you own that or not?

2. How do you use? What are the uses of your computer? Only for daily living or learning/studying also? (Presentation in the class, email communication, social communication, job search, online application for job/stipend)

3. What software do u use in your computer (prayer timetable, newspaper, spell checker, dictionaries)? How do you collect and install those SWs?

4. Do you need to customize your computer regarding your disability like adjusting font size, boldness, zoom, screen adjustment of glare and light, text background, large icon, larger cursor, special key board

5. Do you think a particular brand or type or configuration of computer is/ would be ideal for your need? Then what is that?

6. Are the computers useful for your living and study?

7. What are the difficulties to use computer regarding your disability type? How did you overcome/adjust with that? Tell me an incidence from your memory.

8. How did you learn to use computer? Did you have any hesitation/ or fear to use computer? How did you overcome that?

9. Do you think your computer use is different than student with other types of disability? Please explain if you perceive any difference.

☐ Recorder:

1. Do you use any recorder? What are the features of that?

2. How and when do use this recorder?

3. How do you listen the recorder? Is there any specific software for customizing the record like rewind, forward, bookmark, pause, editing?

4. How do you learn from the recorded lecture? Do you transcribe all the record or just listen again and again to remember? How you can find the exact recorded file if it is needed later?

5. Are the recorders useful for your living and study?

6. What are the difficulties to use recorder regarding your disability type? How did you overcome/adjust with that? Tell me an incidence from your memory.

7. How did you learn to use recorder? Did you have any hesitation or fear to use recorder? How did you overcome that?

☐ Internet:

1. How do you browse internet? What do you use internet for (google, msn, Facebook, WhatsApp, wiki, blogging, YouTube, amusement)? Which one you use most? Tell me the purpose of such use.
2. Do you use any assistive technology for using internet?
3. Is internet useful for your living and study?
4. Do you have any <u>online group</u> where you can ask help, share experience and get new information regarding technology for your learning as well as reading?
5. What are the difficulties to use internet regarding your disability type? How did you overcome/adjust with that? Tell me an incidence from your memory.
6. How did you learn to use internet? Did you have any hesitation or fear to use internet? How did you overcome that?
7. Do you think your internet use is different than student with other types of disability? Please explain if you perceive any difference.

☐ Assistive Technology:

1. Any assistive technology particularly for your special need?
2. What are the ATs you are using? How do you use? For what purposes?
3. Do you feel these ATs are beneficial for you to use generic technologies for your living and learning?
4. What are the difficulties to use ATs regarding your disability type? How did you overcome/adjust with that? Tell me an incidence from your memory.
5. How did you learn to use assistive technologies? Did you have any hesitation or fear to use these? How did you overcome that?

☐ Other digital devices

1. Do you have or use other devices like the following:

☐ Scanner   ☐ Printer   ☐ Others (mention name/s) …………………

C. Factors influencing use of technology

a. What factors influence you to use digital technology? How do they enable you? Can you provide an instance of how the factors influenced you to use technology?

In brief:

Sources of Support (who provides the support; influential people):	
Nature of Support (what kind of support):	
Evaluation of Support (how useful or effective was the support perceived to be):	

b. What factors challenge you to use digital technology? How do they inhibit you? Could you overcome the challenge/s? Tell me an instance where any particular barrier was inhibiting you but you overcame that or you still suffer that.

c. How do you describe the university provisions for you to use digital technology? Comment on the existing technology facilities/assistance you are getting from the university.

d. How much do you think your teachers, and other students have been considerate of the nature of your particular needs to use technology?

e. Can you provide any instance of how your needs for using technology was addressed/not addressed in the university? (please do not mention any identifying sign)

D. Perception on the impact of digital technology

a. How do you describe the consequence of using digital technology on your learning and living?

b. Can you tell me any particular instances where you found technologies are advantageous/disadvantageous for your learning?

E. Future integration

    a. What kind of support would you like that is not currently available to you?

    b. How your current experience can inform the future integration of digital technologies into the university?

Tool 2: Questions for FGD

1. What digital technologies students with disability are using in this university?

2. How does the use of digital technology differ between students with various forms of a disability/ across disability types?

3. What are the main factors of using/not using digital technology by students with disability in this university?

4. In what ways the digital technologies are helpful to students with disability in university? Does it have any disadvantages for your living and learning?

5. What is your opinion regarding digital technology facilities provided by the university?

6. What are your suggestions for services the university could offer for the betterment of technology experiences of students with disability?

7. Imagine that you are part of a committee designing digital technology services for students with disability in the university.

    a) What are the factors that you will make sure your committee considers in designing these services?

    b) How you will recommend your current experience (type of technology you are using, adjustment needed to use those technology, etc.) to be considered for other disabled students in the university?

8. Would you like to add something more which we have not discussed yet regarding disabled students' technology use in the university?

<p style="text-align:center">Second phase data collection instruments</p>

<p style="text-align:center">Tool 3: interview questions for the disabled students on their social context (network, capitals, identity)</p>

1. Who are the different people that give you help and support? At university? What sorts of things do they help you with? How do you keep contact with them?

2. How do you consider their support and help? Please do mention any example where you find their support advantageous/ non-advantageous.

3. How do you think that people see you at university (a person without disability or person with disability)? Why? Is this how you see yourself?

4. Do you often need to negotiate between your identities as student with disability and student without disability at the university? How the university supports/inhibits you regarding the identity negotiation?

5. Have you ever experienced any disadvantages while participating in university activities/programs? What would be the reasons behind these disadvantages?

6. Please tell me about your parents and other family members (Age, Education, family background, employment, technological know-how, etc.). How do they support you for studying at the university and using digital technology?

Tool 4: Interview question for senior student/mentor

1. How did you become acquainted with students with disabilities in the university? How you perceive their needs to study at the university?

2. How you support your junior students in general and particularly for using digital technology?

3. How you see the impact of your support on students with disabilities? Have you ever got any feedback from them regarding your support?

4. What do you think of the quality of the support services from the university for students with disabilities regarding technology?

Tool 5: Interview question for faculty and staff

1. How do you provide support for students in general? What specific supports do you provide for students with disabilities?

2. How you support students with disabilities for using technology for both their study and social life?

    Probe: Regarding different types of disabilities and different types of technology.

3. What are the provisions/support services that the university provides to general students regarding technology?

4. What are the university provisions/support services for students with disabilities in general (offline) and particularly for technology use? How do you evaluate the supports provided by the university? How the technology supports services can be improved?

5. How do you perceive the impact of digital technology use of students with disabilities on their study and everyday life?

6. What are the barriers they experience in the university regarding technology use for their study and living? How the students overcome the barriers? How you support the students to overcome the barriers?

Tool 6: Interview questions for philanthropic/ third party organizations:

1. How do you provide support for students with disabilities in higher education in general? What supports do you provide for technology?

    Probe: Regarding different types of disabilities and different types of technology.

2. What are your organizational goals and objective in terms of supporting the students?

3. How do you gain a sense of the needs of the students?

4. How do you see the impact of your support on the students?

5. Have you ever received any feedback from the students regarding the support services you are providing?

Appendix IX: Photographs

Photograph 1 and 2: A participant with physical disability is using laptop computer
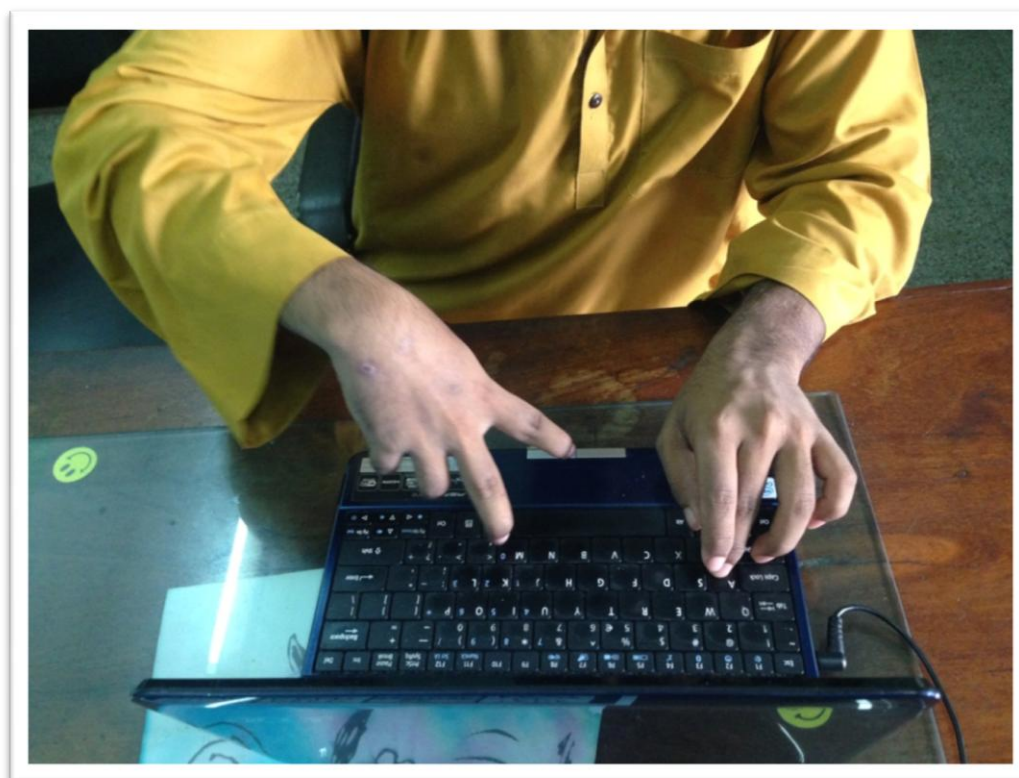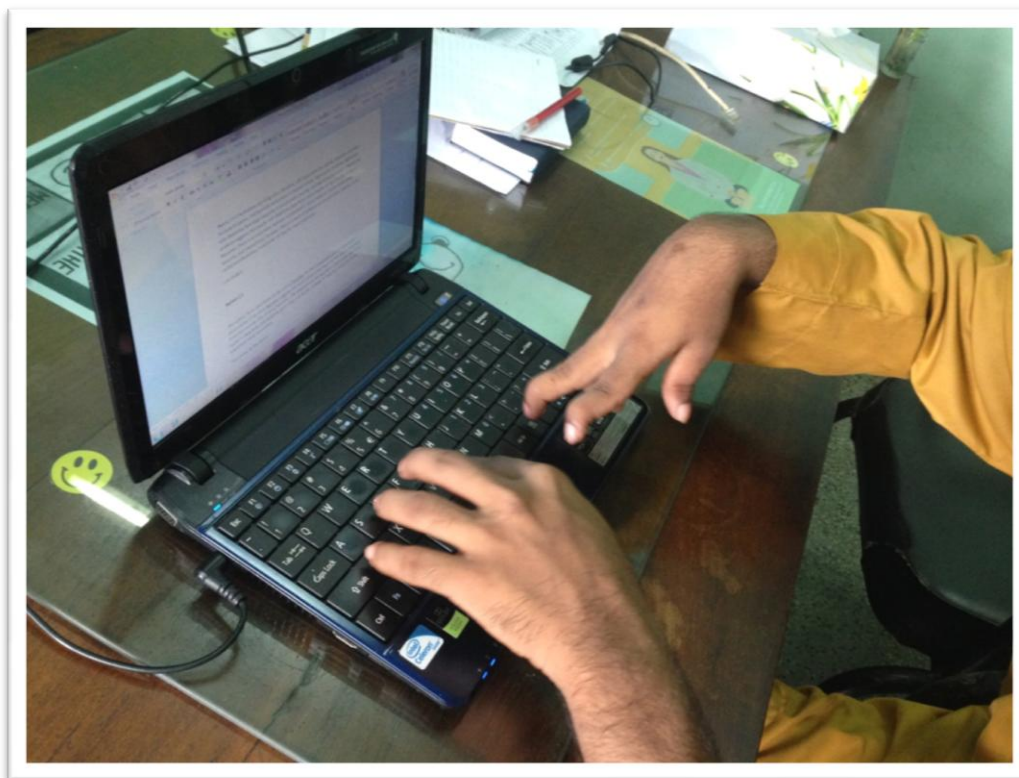
Photograph 3: Inside the Visual Impairment Resource Center

Photograph 4: The never-used Braille printer at the center